

THE IRON AGE

THURSDAY MARCH 17, 1892.

The Johnson Engine Lathe.

A new engine lathe has been designed and built by Israel H. Johnson, Jr., & Co. of Philadelphia. Its features may be referred to as follows: The lathe swings 43 inches over the ways, is very heavy, powerfully back geared and triple geared to the internally cut gear on the face plate. All driving gears are placed on the front of the headstock, where they are within convenient reach, and in which position the power required for driving is brought down to the work.

The spindles are of forged steel, large diameters, and the rack, screws, shafts, studs and pinions are also of steel. The tailstock has a long bearing on the bed, is moved by crank, back geared to the rack on the bed used for the carriage, clamped to the bed with four heavy bolts, and provided with a pawl to drop in the rack cast in the center of the bed, making a firm resistance for the tailstock when carrying very heavy weights on the centers.

The carriage is very stiff, with long bearings fitted its entire length to the bed,

The customs officers, with a view to popularity, would naturally turn into the general treasury whatever could be so allotted, while the Crown was anxious to get its share. Hence the King designated a naval officer on the station, usually the senior one, to look after the collectors' accounts and see that the proper share fell to the King. With the independence of the colonies, the customs functions of a naval officer would have expired had not our fathers had something of the zest for patronage, which has not departed from their descendants.

Basic Steel Profits.

Almost simultaneously with the announcement of the decision of an English court denying an application for the extension of the Thomas & Gilchrist basic steel patent, come, through a German source, interesting details of the amounts of money realized by the inventors. Perry C. Gilchrist has sent to the editors of *Stahl und Eisen* detailed tables, from which the following data are taken: At first the two cousins attempted to work

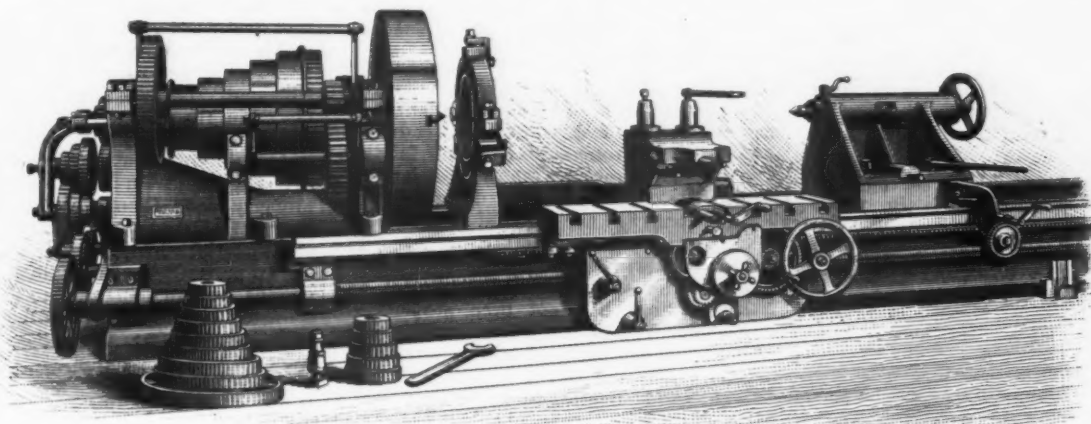
patents in different countries, the figures being reduced from the German equivalents:

United States.....	\$222,444
Canada.....	387
Austria.....	71,110
Germany.....	142,238
France and Belgium....	357,850
Sweden.....	1,440
Russia.....	4,048
Spain and Italy.....	2,222
Luxemburg.....	115,258
Total.....	\$916,997

Costs on these transactions were \$143,581, and there was paid also by agreement, to get rid of lawsuits and patent claims, a total of \$252,905, leaving a net profit of \$520,511.

As compared with the results obtained by Bessemer from his invention, these figures seem relatively small.

A Convenient Table.—The Farquhar Heating Company of Chicago have in use in their machine shop a device which is probably new to many of our readers.



THE JOHNSON ENGINE LATHE.

gibbed to the bed front on the outside and inside of the bed, and also gibbed to the bed on the back the entire length of the carriage. The tool rest is very stiff and solid, provided with power cross feed, and power feed to the top slide of compound rest; the rest may be furnished with either two tool posts or clamps for holding the tools.

The apron is of entirely new design, the rack pinion being supported in firm bearing close up to the drive in the rack; all other gear studs are of large diameters, and well supported. The cross and lateral feeds are both driven by one friction and so arranged that it is impossible to get both feeds in at the same time, or get either feed in while cutting threads. The apron is so constructed that there is no spring under a heavy cut, thereby giving all the strength of the gears to be utilized in driving the feeds, which are driven by cone gearing on the headstock, with shift pin which gives three grades of feed without changing gears. These lathes are especially adapted for very heavy work.

Naval Officer of Customs.—The title of Naval Officer, borne by a customs officer, whose duties are entirely upon the land, is a puzzle to many persons. It was not, at first, that of a civil official. Under the British system there were two treasuries, the general one and that of the Crown.

the patents themselves, but from 1877 to the close of 1882 the revenue was \$13,618, while outlays for experiments, patents, &c., footed up to \$17,480. This unfavorable result apparently led to the formation of a company consisting of G. J. Snelus, Bolckow, Vaughan & Co., E. Riley, E. P. Martin, Griffith and Chaloner. In the first year of its existence the profit was \$2880, which gradually increased until it rose to about \$125,000 in 1891. The total receipts from 1883 to 1891 inclusive were \$743,916 out of which \$122,025 was paid in costs, while the total profits of Gilchrist and of Thomas' sister were \$243,378, the earnings of the associates were \$342,637. In these profits there is not included, however, \$342,816 worth of stock, that sum having been expended in the different English basic works, the North Eastern Steel Company, Dinsdale Wire and Steel Company, Staffordshire Steel and Ingot Iron Company, Baisley Basic Company, Brymbo Steel Company, and Acklam Iron Company. Gilchrist estimates the value of the stock at \$310,133, which in 1892 yielded \$35,765 in interest and dividends.

Gilchrist's personal interest in English concerns amounts to \$295,186, and that of Thomas' sister to \$374,366. The former drew on these investments during 1891 \$17,966, and the latter \$17,798.

The following table presents the amounts received up to the close of 1891 for the

Every shearing and punching machine is provided with a heavy wooden table to form a support for the plates which are to be cut or punched. The top of the table is cut up into compartments about a foot square by narrow strips nailed on it. Each of these compartments contains a steel ball about 2½ inches in diameter. The height of the table is such that a plate laid on the tops of these balls will be on a level with the jaws of the shears or punches. It will thus be seen that a very heavy plate can be handled on such a table by one operator, who can at the same time attend to the machine. It is quite customary in bridge shops, &c., to see two and sometimes three men holding a plate in position to be punched or sheared. The simple device just mentioned not only does away with much manual labor, thus saving cost, but it holds the plate at all times in a perfectly level position, which is necessary to secure good work.

Statistics given in the annual report of the Massachusetts Railroad Commissioners show there are in the State 279½ miles of overhead system electric street railways, with 13 miles under construction, an increase of 128 miles during the year. There are also about 10 miles of the storage battery system. The speed of electrics when unimpeded by horse cars ranges from 6 to 15 miles per hour.

The Strength of Car Couplers.

The strength of car couplers of the Master Car Builders' type was the subject of a paper read by W. Forsyth, mechanical engineer of the Chicago, Burlington and Quincy Railroad, before the Western Railway Club. We quote the following from it.

Some couplers are admittedly weak in resistance to tensile and compression stresses, and a specification for M. C. B. couplers should provide for tests which will measure the pulling resistance, as well as to blows delivered somewhat like that when two cars are thrown in violent contact. To get necessary data for such a specification it is necessary to test couplers of various makes in each way, and see what is the maximum that may be expected. In conducting such tests at Aurora we have two pieces of testing apparatus adequate for the heavy work required; a Riehle testing machine, made for testing large bridge rods, having a capacity of 200,000 pounds, and an axle-testing machine having a drop weight of 1640 pounds, with a maximum fall of 30 feet. We have already made a number of tests of M. C. B. couplers on these machines, and I will give some of the results.

In the tensile machine two couplers of the same kind were pulled against each other, and Tables I and II give the result of a few of these tests:

Table I.—Tensile Resistance of Malleable Couplers.

Date.	Type.	Ultimate strength.	Location of fracture.
1888..	A	80,000 pounds.	In bar at bottom lug.
1888..	A	89,600 pounds.	In wrought-iron knuckle tongue 2 inch from end.
1889..	B	102,000 pounds.	In bar at lug.
1891..	B	112,000 pounds.	In bar at lug.
1892..	C	90,000 pounds.	In steel knuckle.
1892..	E	121,000 pounds.	In steel knuckle.

Note.—The average of six malleable bars, and including four different kinds, was less than 100,000 pounds, and one-half of the bars were broken.

Table II.—Tensile Resistance of Steel Couplers.

Date.	Type.	Ultimate strength.	Location of fracture.
1892..	F	105,800 pounds.	Knuckle broken
1891..	H	148,800 pounds.	Knuckle broken
1892..	D	98,200 pounds.	Knuckle broken
1892..	I	122,200 pounds.	Knuckle broken
1892..	I	108,100 pounds.	Knuckle broken

Note.—The average strength was 116,300 pounds. None of the steel bars were broken, but all failed in the knuckles.

The strength of the material in wrought-iron knuckles is not as great as the bar iron from which they are formed. Broken knuckles of this kind are invariably coarsely crystalline. I had a tensile test piece made out of one of these knuckles, and found the ultimate strength to be 48,800 pounds; elastic limit, 27,300 pounds; elongation, 15 per cent. in 2 inches.

In Tables III and IV are given the results of drop tests, in which the weight of 1640 pounds struck the knuckle. Iron axles, $4\frac{1}{2}$ inches diameter at the center, must stand three blows from 10 feet and two at 15 feet from a weight of 1640 pounds, with supports 3 feet apart from center to center.

Table III.—Drop Tests of Malleable Couplers with Wrought-Iron Knuckles.

Date.	Type.	Blows and results.
1891	1 A	Three blows, 10 feet.—One at 15 feet bent barrel $1\frac{1}{2}$ inches out of line; lower lug of knuckle cracked.
1891	2 A	Three blows, 10 feet.—Lower lug of coupler cracked through pinhole.
1891	3 A	Three blows, 10 feet, five blows, 15 feet.—Arm broken by weight glancing from knuckle.
1891	4 A	Three blows, 10 feet, one blow at 15 feet.—lower lug of knuckle cracked.
1891	5 A	Three blows, 10 feet, one at 15 feet.—Upper knuckle lug cracked.
1891	6 A	Two blows, 10 feet.—Upper knuckle lug cracked.
1891	7 A	Three blows, 15 feet.—Cracked coupler arm, knuckle opening reduced from 3 1-16 inches to 2 3-8 inches, stem broken and back cracked.
1891	8 A	Weight striking arm only; two blows, 10 feet.—Arm broken off.
1891	9 B	Three blows, 10 feet.—Both lugs and most of back broken.
1891	10 C	One blow, 10 feet.—Broke tongue of steel knuckle.
1891	11 E	Two blows, 10 feet.—Cracked steel knuckle; third blow, 10 feet, and one at 15 feet.—Broke knuckle.

Table IV.—Drop Test of Steel Couplers with Steel Knuckles.

Date.	Type.	Blows and results.
1892	12 F	One blow, 10 feet.—Broke bar back of knuckle.
1892	13 I	Two blows, 10 feet.—Broke knuckle at pivot pinhole.
1892	14 D	Three blows, 10 feet, two blows, 15 feet.—Broke in tongue of knuckle just above pinhole.

These drop tests show a wide variation in the strength in the different types of couplers, one kind breaking under the first blow from 10 feet, while others endure the full test for iron axles $4\frac{1}{2}$ inches in diameter. The fractures show also not only the weak points in the design, but the poor quality of the material in both malleable-iron and cast-steel couplers. The steel bars were evidently made of a grade of steel not suitable for the purpose, and the castings had not been properly annealed. Tensile test pieces made from the same cast as Coupler I had a strength of only 42,000 and 49,000 pounds per square inch, and elongation of 1 per cent. and 2 per cent. in only 8 inches.

A test of a specimen from another coupler shows that the material is much better adapted to the requirements. It is as follows:

	Not annealed.	Annealed.
Elastic limit, pounds per square inch.....	48,000	43,800
Breaking strain, pounds per square inch.....	64,000	64,000
Elongation, per cent. in 4 inches.....	8.25	12.5
Reduction of area, per cent.....	11.1	21.3

I have already said enough to show that the M. C. B. coupler as now made is a weak one, both in design and material, and as we cannot change the shape to a strong form without interfering with the standard lines and destroying interchangeability, the only thing that can be done is to make the bar and knuckle of the strongest material possible. The form also requires the coupler to be cast, so the only choice lies between malleable iron and cast steel.

Malleable Iron.—The report on the use of malleable iron in car construction read at the last M. C. B. Convention takes up the question as to whether malleable iron is the best material for the M. C. B. couplers, and gives a table showing the strength of thick and thin malleable cast iron specimens. The table showed a strength of 25,000 to 35,000 pounds per square inch and an elongation of 1 per cent. to 2 per cent. in 4 inches.

Quite recently the National Malleable Casting Company have had made an inves-

tigation of the strength of malleable-iron castings by D. L. Barnes, consulting engineer. The samples submitted for test were from 2.63 inches to 3 inches wide and 0.247 inches to 1.03 inches thick. The average ultimate strength of eight samples with skin unbroken was 27,870 pounds per square inch; 12 pieces with edges dressed averaged 27,786 pounds, and five pieces dressed on all sides averaged 25,560 pounds. The elongation of the test piece was so small that it was not measured. The internal structure of the broken test pieces showed a want of homogeneity. These bars, especially prepared for tests, and representing doubtless the best that can be done in malleable castings, show as an average of 25 specimens a tensile strength less than 28,000 pounds per square inch and practically no elongation. Measured by such figures we must conclude that malleable iron does not possess sufficient strength and ductility to make it the best material for the severe service of the M. C. B. coupler.

Steel Castings.—Steel castings, when properly made, possess a strength greater than wrought iron, and a ductility nearly equal to it. The irregular character of many steel castings made heretofore has given them a bad reputation, but the sound part of a steel casting is so superior in strength and ductility to any other kind of casting that the best efforts of our metallurgists have been directed to the problem of the production of sound steel castings, and as a result the quality of such castings is gradually improving. I believe that finally the process will be so improved, molds and foundry manipulations so well understood, and the workmen so skillfully educated, that absolute reliance can be placed on the product.

The tensile resistance of the couplers tested did not show the superior strength to be expected from this material, but when properly made I believe there is a better prospect of getting strong couplers, made of a material which in repeated tests has shown a strength of 60,000 to 70,000 pounds, and an elongation of 15 to 20 per cent. in 8 inches, than from one which will not average over 30,000 pounds, with practically no elongation.

In making a specification for testing M. C. B. couplers I should place the figures for tensile strength of the material about as high as any bar has been found to endure, for I think the competition among coupler makers will soon result in the production of a stronger bar than they are now making, if the stronger bar is demanded by the railroad companies. I would require them to endure a pulling load of 125,000 pounds, and in time this could probably be raised to 150,000 pounds. For the drop test I would require the same kind and number of blows as are given M. C. B. 40,000 pound iron axles, two couplers out of each 200 to be tested in the tensile machine, and the one remaining unbroken to be tested under the drop.

Proposed Specifications for Strength of M. C. B. Couplers.—Two sample couplers, selected from each lot of 200, when tested for tensile resistance, must not break under a load of 125,000 pounds.

The coupler remaining sound must endure a drop test of 1640 pounds, three blows falling 10 feet and two blows falling 15 feet, the die striking the knuckle, the tail or bar to rest on a solid block of iron weighing not less than 500 pounds.

A test bar made from the same cast as the coupler, or cut from a coupler, must have a tensile strength of 60,000 to 70,000 pounds, and an elongation of 15 to 20 per cent. in 4 inches, or 10 to 15 per cent. in 8 inches.

Bolckow, Vaughan & Co. of Middlesborough, the great North of England firm of iron manufacturers, divided only $2\frac{1}{2}$ per cent. for 1891.

The Reynolds Molding Machine.

A molding machine embodying several new features was recently placed on the market by the James Reynolds Mfg. Company of New Haven, Conn., the machine being the invention of P. O'Conner, the general manager of the company. The machine is so made that it can be set up on brackets or placed on a brass molder's

view of the bail or swinging frame that draws down the pressure plate, the lugs on the main case or frame to which this bail is attached being shown in horizontal section. The machine being supplied with suitable patterns, the lever B is operated to bring it in position shown in Fig. 1, to elevate the pattern slide so that the patterns will project the desired distance above the bed. The flask is then placed in position and filled with sand, the presser plate

Basic Slag for Fertilizing.*

BY W. H. MORRIS, POTTSTOWN.

I have been asked by our president to present a paper on the slag from the basic Bessemer process as prepared for fertilizing.

As W. B. Phillips in May, 1888, volume 17, presented to the Birmingham meeting

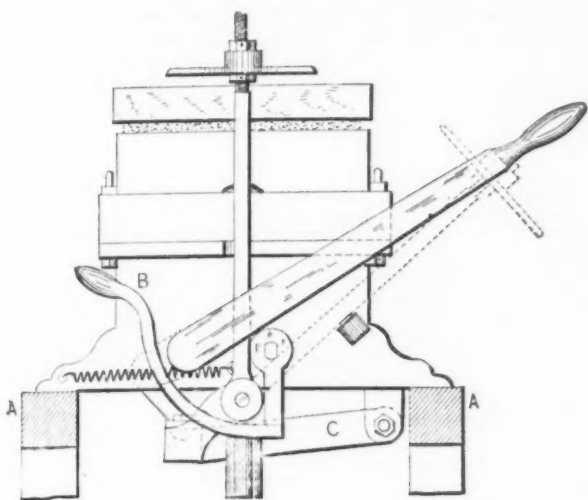


Fig. 1.—Side Elevation.

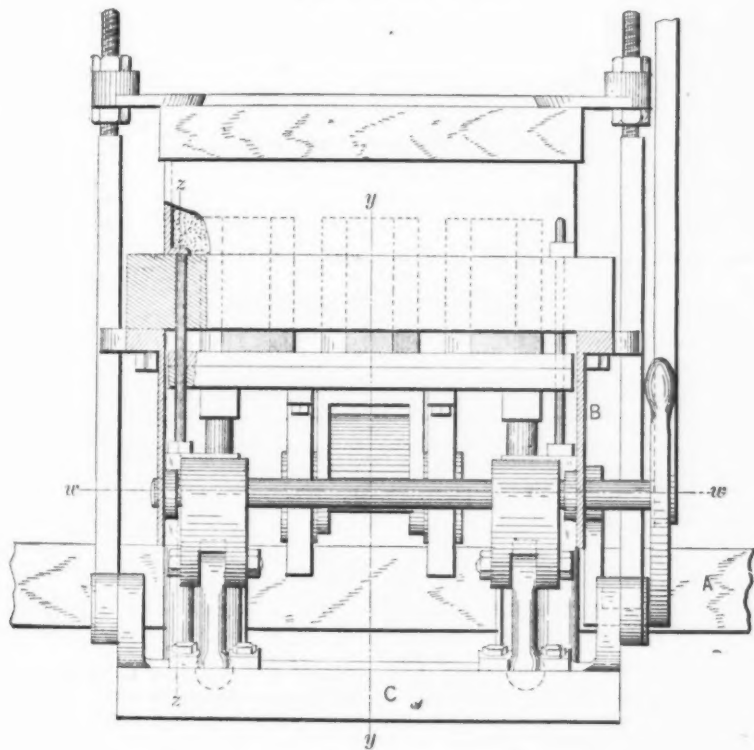


Fig. 3.—Enlarged Partial Section on Line x x of Fig. 2.

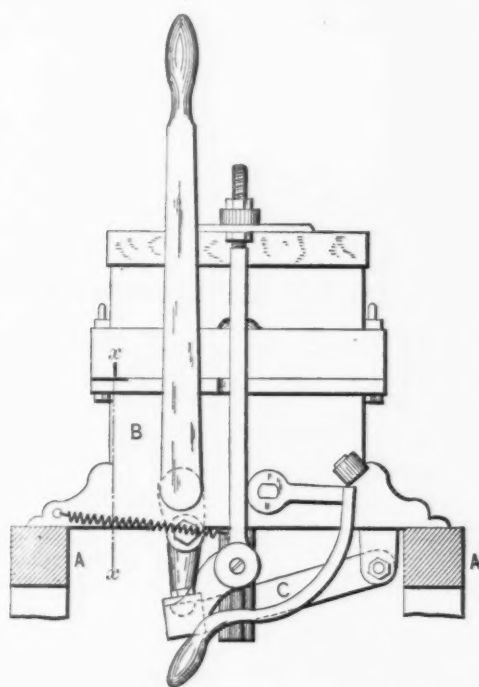


Fig. 2.—Same as Fig. 1 With Presser Board Drawn Down.

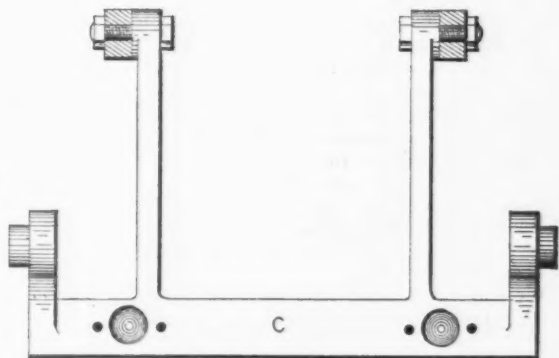


Fig. 4.—Plan View of Swinging Frame that Draws Down the Pressure Plate.

THE REYNOLDS MOLDING MACHINE.

bench. For pressing the sand into the flask the 30-inch lever is used, and it is stated that single handed more pressure can be obtained than the combined strength of two men can get from the ordinary hand presser. Fig. 1 shows the flask in position, filled with sand, and the pressing board and platen in position ready for pressing. Fig. 2 shows the position of the various parts when the sand has been pressed into the flask. Fig. 3 is an enlarged partial section on the line x x of Fig. 2, the parts not in section being shown in front elevation. Fig. 4 is a plan

meantime being turned to the rear, as indicated by the broken lines in Fig. 1. After filling the flask with sand, the presser board is placed on top and the presser plate thrown into position above it. The presser lever is then brought forward in the position shown in Fig. 2, whereby the toggle arms which it operates are straightened to depress the swinging bail C and thereby draw downwardly the presser plate into the position shown in Fig. 2 to firmly pack the sand. The machine is simple in its operation and strongly and durably built.

an able paper on this subject as developed up to that time, there seems little for me to add, and perhaps our experience can be well expressed by the homely proverb, "The proof of the pudding is in the eating." As the Pottstown Iron Co. are the only parties manufacturing this product in this country, it may be interesting to you to have the writer's personal experience in the use of it.

I have been using this material for some years on my lawn and garden, and have

*Read at the Baltimore meeting of the American Institute of Mining Engineers.

found it better than anything I have ever had, and am sure that any of you who could see the green grass during last month as bright as in early fall wherever the ground was bare from snow would be forced to acknowledge the advantages of this soil enricher. The grass on my lawn, as well as around our office, is green the whole winter, and at our steel works we have raised very good sod by the use of this phosphate, where without it we were unable to get the grass to grow either from seed or when repeatedly sodded. The same applies to garden truck; when the soil was first broken up a good crop of vegetables was easily raised. My own gardener has had several premiums from Philadelphia seedsmen, notably last year,

The use of from 300 to 700 pounds to the acre is desirable, and it should be put into the soil at the proper depth. The full effect will not be shown the first year, but its beneficial influence will last through the second and third seasons, and by constant applying, its value to the soil is regularly increased. Along with suitable manure to furnish the ammonia, or with kainite to furnish some potash, it leaves nothing to be desired in the way of a model fertilizer.

Up to the present time between 4,000,000 and 5,000,000 tons have been sold. Our slag is a by-product from the basic Bessemer converter, but, unfortunately, the slag from the open-hearth furnace is not nearly so rich in phosphoric acid, and con-

1 pound fuel oil, 36 gravity evaporated 16.48 pounds water from and at 212° temperature. 1 cubic foot gas, 30 C. P. evaporated 1.28 pounds water from and at 212° temperature.

The gas used was that obtained in the distillation of petroleum, having about the same fuel value as natural or coal gas of equal candle-power.

Taking the efficiency of bituminous coal as a basis, which is not greatly at variance with the results generally claimed for it, we find the calorific energy of petroleum to be more than 60 per cent. greater than that of coal; whereas, theoretically speaking, petroleum exceeds coal only about 45 per cent.—the one containing 14,500 heat units, and the other 21,000. From this we are justified in deducing

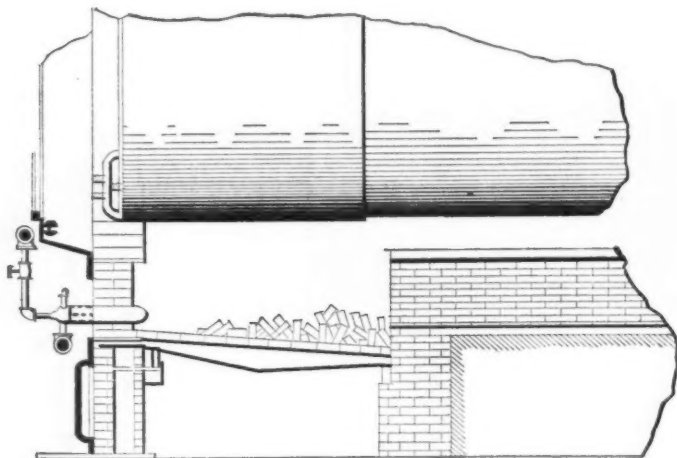


Fig. 1.—Section of Boiler.

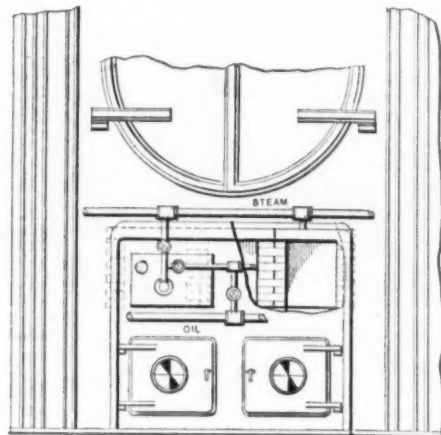


Fig. 2.—Front Elevation of Boiler.

the first premium for sugar corn raised early in July, being the first sample sent them.

Our method is to grind the slag very finely so that at least 60 per cent. of it will go through a screen of 22,000 meshes, and 90 per cent. through a screen of 10,000 meshes to the inch, and in this seems to be the main feature of its success.

We have had several wonderful reports from various sections: Among others, where it has doubled the crop of wheat to the acre, and also in fruit-growing sections it has done well. Some claim that it will kill the curculio, the enemy of plum trees, and it has done well in Florida in competition with fish phosphates. The very fine powder will also destroy the bugs that infest the rose bushes and small fruits, and potato bugs are driven away by it. This, indeed, is one great merit for it, as there are no seeds or eggs of an animal character to be transmitted into the soil, it having been manufactured at a heat of nearly 3000°.

We can fairly claim that there is more of this phosphate used than of any other brand, as the product of all the Continental steel works is absorbed, as well as those in England. It was some years before the English (who are slow to adopt a new thing) were willing to use it, and one of the managers of a well-known English basic works expressed himself as considering it a national calamity that his slag was taken by the Germans. Since then, however, it has been absorbed at home, and I sincerely trust our own people will soon learn to realize the value of it.

We are about putting in a new mill for grinding it, and hope to have a constantly increasing demand. Our phosphoric acid runs over 20%; sometimes as high as 25, and at the price we sell it, it certainly is the cheapest phosphate in the world.

In Germany it has been found by practical experiment that the whole of the phosphoric acid is available, though for chemical reasons it does not respond to the same tests as the ordinary acid phosphate.



Fig. 3.—Side Elevation.

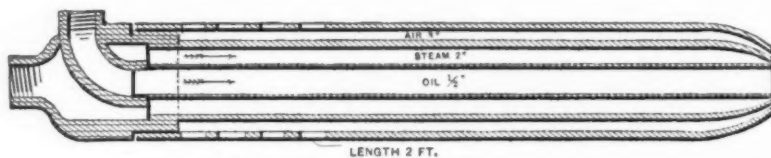


Fig. 4.—Section.

THE MITCHELL OIL BURNER.

sequently not so well adapted to fertilizing purposes. Dr. Wyatt estimates the phosphoric acid withdrawn yearly from the soil in the United States at nearly 5,000,000 tons.

Oil as Fuel.

Max Livingston some time since placed before the members of the Engineers' Club of Philadelphia some comparative figures, derived from careful tests undertaken to ascertain the relative value of coal, petroleum and gas. We quote as follows from his paper:

These tests, made under the same condition with a so-called double-deck tubular boiler, 60 inches diameter, 15 feet long, connected to an upper steam drum, 50 inches diameter, 16 feet long, by three necks, 15 inches diameter, 12 inches high, gave the following results:

1 pound anthracite coal evaporated 9.70 pounds water from and at 212° temperature. 1 pound bituminous coal evaporated 10.14 pounds water from and at 212° temperature.

that the percentage of loss in heat units in ordinary working is considerably smaller in oil than coal. This result was not obtained under particularly favorable conditions. The furnace had previously been used for coal, and suffered but few alterations, which consisted mainly in the covering of grate bars and placing a barrier of broken fire bricks, slag, etc., against the bridge-wall, as exhibited herewith.

The oil was sprayed into the furnace, mingled with steam and air at the pleasure of the engineer, by a Mitchell burner, the construction of which is shown in the accompanying figures, and does not differ essentially from that of other oil burners depending on steam and air for efficient work. Besides its higher calorific energy, which alone recommends it as a highly desirable substitute for coal on ocean steamers, petroleum has many other advantages, of which we will enumerate only the following:

Reduction of labor; in many establishments one engineer will do the work that,

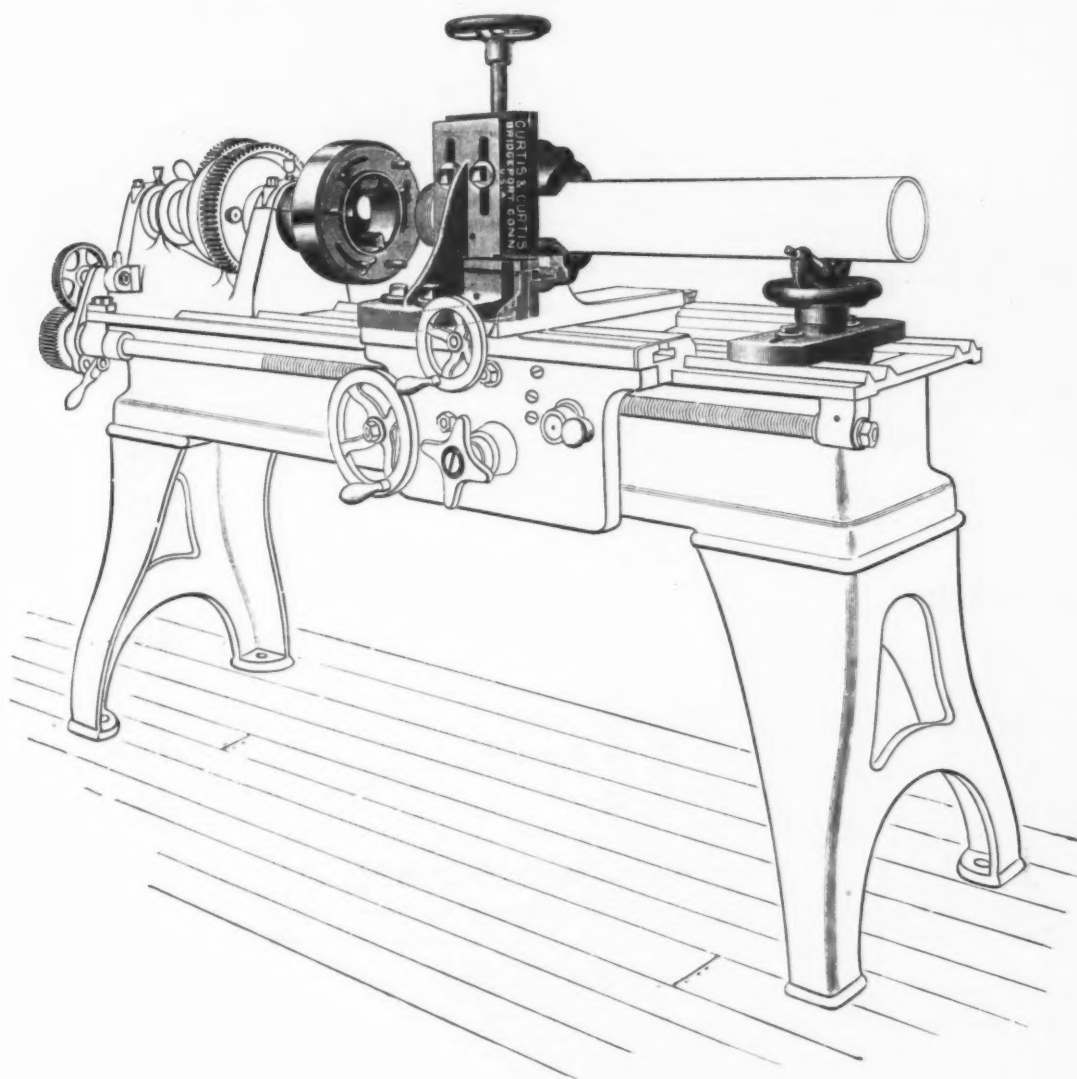
when using coal, would require him to have several assistants. Uniformity of steam-pressure, which is much more easily maintained with oil than with coal. Less cleaning of flues or tubes, and fewer repairs to boilers.

Disappearance of dirt and coal-dust, bringing in its train more comfort and better health to the firemen.

Whether these advantages are sufficient to make petroleum a successful competitor of coal depends on the relative prices of the two fuels, and as these are mainly governed by transportation tariffs, the comparative cost resolves itself simply into

attached to the bed of the lathe, to support long lengths of pipe, as shown by the heavy engraving in the accompanying illustration. The pipe is held securely by the vise on the carriage and fed to the revolving dies by moving the carriage by hand, or this can be done automatically by using the lead screw of the lathe, set to the number of threads corresponding to the standard of thread to be cut. When the thread is cut to the length required the dies can be opened by turning the face plate and the pipe taken out without running back. All the dies are made adjustable to any variation of the fittings and

Co. refused to sign the scale, claiming that the wages to be paid the plate-mill crew were entirely too high and that unless a reduction was made they would run their mill with non union men. Several conferences were held with the firm, but as the scale had been signed by other manufacturers in Pittsburgh it was impossible to make any reduction in the scale as presented to Moorhead, Brother & Co. The result of the conflict between the firm and the Amalgamated Association was that non-union men were engaged and the plant has since been operated by that class of labor. Now that Moorhead, Brother & Co. have



THE CURTIS PIPE THREADING ATTACHMENT FOR LATHES.

a question of arithmetic for different localities.

The Curtis Pipe Threading Attachment for Lathes.

The difficulty attending the attempt to thread wrought-iron pipe by means of any machine except a regular pipe-threading machine is well known. In most shops it is done on an ordinary lathe with the usual chasing tool. This is not only a difficult task, but it is not always possible to cut a thread that will give a good joint. The lathe attachment here illustrated has been placed on the market by Curtis & Curtis of Bridgeport, Conn. The lathe can be turned into a power pipe-threading machine, and pipe of any length can be threaded rapidly and correctly. The attachment consists of a die-carrying head, attached to the spindle like a chuck, an adjustable, self-centering vise attached to the carriage, and an adjustable pipe rest,

they adjust from one size of pipe to another so that each set of dies threads several sizes of pipe without changing. To fit this attachment to any make or size of lathe, no machine work is necessary except on the flange connecting the die head to the spindle. The attachment shown in the cut has a range from 1 to 4 inches, right hand, inclusive, and is attachable to lathes of any make or size from 14 to 24 inches swing.

We have already made brief mention of the fact that the puddlers in the employ of Moorhead, Brother & Co., proprietors of the Vesuvius Iron and Nail Works, at Pittsburgh, have been reduced from \$5 50 to \$5 per ton for puddling. This movement on the part of the firm is of considerable importance. Last summer when the Amalgamated Association of Iron and Steel Workers had formulated a scale governing wages in rolling mills to be operated during 1891-92, Moorhead, Brother &

succeeded in reducing the price for boiling from \$5.50 to \$5 per ton, it will undoubtedly give them quite an advantage over other Pittsburgh manufacturers who are paying \$5.50 per ton, and will be compelled to pay it until the present Amalgamated Association scale expires, which will be on June 30 next. Predictions have been made that the action of Moorhead, Brother & Co. is but a forerunner of what will be done by other Pittsburgh manufacturers and that unless the Amalgamated Association agrees to reduce the price of boiling to \$5 per ton a strike will take place. The impression prevails that a determined effort will be made this year to bring the price of puddling down in Pittsburgh to \$5 on a 2-cent card.

The Humboldt Chamber of Commerce of Eureka, Cal., has issued a petition to Congress setting forth the relations of deep-water harbors to the general prosperity as applied to the conditions existing on the Pacific Coast.

The Corliss Steam Engine Governor.

Our drawings illustrate a governor which has been used for some time with very satisfactory results on the engines built by the Corliss Steam Engine Company of Providence, R. I. In other forms of fly ball governors, in case of disaster to the regulator belt or operating mechanism of the governor, the fly-balls will drop, thereby holding the steam valves in an open position, admitting steam to the cylinder and causing the engine to race. In this governor means are provided, in case of accident to the belt or operating mechanism, for causing the external sleeve of the governor to rise to its extreme highest point and thereby operate the valve-cut-off mechanism to allow the valves to close and remain closed to the admission of steam, and so to stop the engine, notwithstanding the fallen position of the balls. A counterpoise acting in conjunction with the water or steadying dash-pot affords means for regulating the position of the governor.

Upon the bed of the engine is held the regulator stand B, upon which slide an internal and external sleeve, C', the latter having an independent sliding motion upon the other, as actuated by the helical spring D. A latch spring serves to lock the two sleeves together resistingly against the compressed spring. The latch spring is

weight and the outer sleeve, released by the action of the spring latch, would rise and the valves would not be opened to admit steam. It is evident that this end must be attained by an automatic device.

The self-removing holder E is pivoted to the stand B, and provided with an anti-friction wheel adapted to receive the combined weight of the locked sleeves and balls, and thereby prevent the latch from coming into operation. When sufficient momentum is imparted to the regulator balls to cause them to rise and lift the locked sleeves, the holder falls of its own weight and leaves the course free for the locked sleeves to fall to the point where the latch will operate, when the spring D will carry the outer sleeve upward and thereby automatically release the steam valves to close and remain closed. A hood G, secured to the upper part of the inner sleeve, serves to prevent the entrance of foreign matters into the working parts of the mechanism. The compound lever I, which actuates the valve-releasing gear in the well known manner, is attached to the outer sleeve.

It will be observed that the apparatus is automatic and requires absolutely no attention.

The New York Central and Hudson River Railroad has closed a contract for 33,500 Hartford steel ties, to be laid in the track

The company have used the couplings since April 16, 1889, and have them attached to 1017 cars and 322 locomotives. Judge Lacombe grants a decree to the complainants for account and injunction. The injunction provides that a certain number of couplings to be fixed upon shall be removed each week.

The Carbon Iron Company.

We have already made reference to the improvements and additions now being made to the plant of the Carbon Iron Company at Pittsburgh. The contract for this work has been let to the Pittsburgh Iron and Steel Engineering Company of Pittsburgh, and already considerable progress has been made. Included in the additions to be made are two 25-ton open hearth

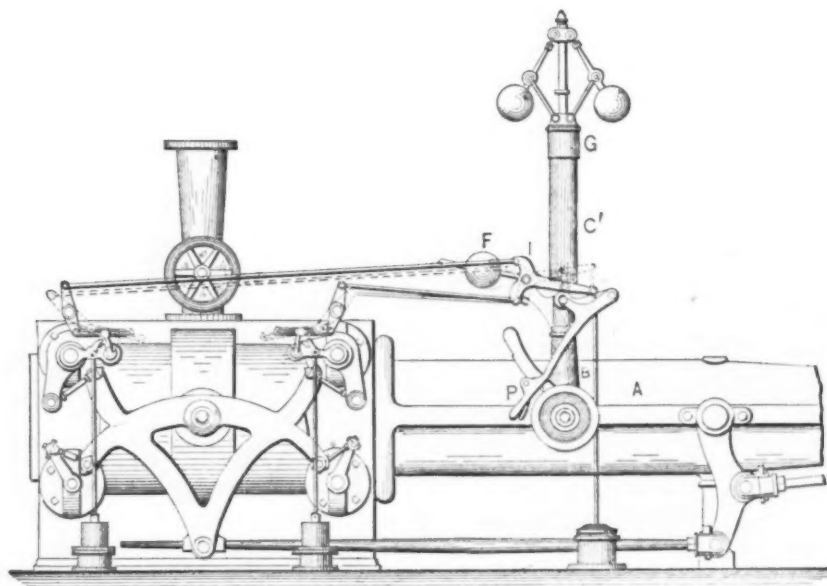


Fig. 1.—Side Elevation of Governor and Attachments.

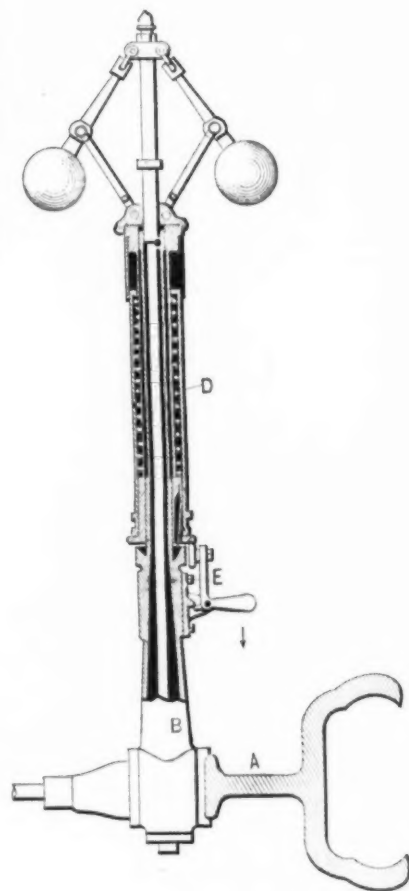


Fig. 2.—Vertical Section.

THE CORLISS STEAM ENGINE GOVERNOR.

so arranged that when the balls sink too low it will be detached and allow the outer sleeve C' to be thrown upward by the spring. The counterpoise F is attached to the sleeve. The inner sleeve, to which the links of the balls are secured, is free to slide up and down to a limited extent on the stand, and the outer sleeve is free to slide upon the inner sleeve to a corresponding extent. The spring D is compressed by drawing the outer sleeve downward until the spring latch comes into play. The compound lever I affords the means for drawing this sleeve downward. The spring may also be compressed by raising the inner sleeve by means of the cut off lever P. When the outer and inner sleeves are thus locked together they serve in the ordinary manner as if they were a single slide; but some provision is necessary to retain them in this position until the engine has taken steam, and the balls have begun to raise the sleeves, otherwise the balls and sleeves would be carried downward by their own

weight between the Grand Central Station yard and Mott Haven Junction. The four tracks will be laid with this tie, and with rails of 100 pounds section. It will be remembered that this tie was put in experimentally at Garrison's nearly three years ago. Its service there has been so satisfactory that this further trial of it is decided upon.

Judge Lacombe, in the United States Circuit Court, handed down yesterday a decree in the suit brought by the Campbell Printing Press and Mfg. Company against the Manhattan Railway Company to enjoin the latter in the use of improvements in couplings. The suit was brought for the infringement of a self-closing device, consisting of a compressive helical spring held with a tubular guide attached to valves for pneumatic pipes. The case was of the utmost importance to the Manhattan Railway Company, as all the rolling stock of the road is equipped with the appliance.

acid furnaces, which are being erected in conjunction with and adjacent to the present open hearth plant, which consists of two 15-ton and two 30 ton furnaces. A three-high plate mill, 124 inches long and 34 inches diameter, with necessary lifting tables will be erected. This mill will be capable of rolling from plates 2 inches down to $\frac{1}{4}$ inch in thickness. The cooling tables for cooling the plates will be 375 feet long. A novel feature in connection with the plate mill, is that the driving screws for regulating the rolls will be operated by electric motors instead of by engine. A lifting or tilting table will also be erected in the plate mill to enable inspectors to examine the under side of the plates before being sheared. This will be a distinctive feature, as we are not aware of any such appliance being in use in any other plant at this time. Three 3-hole soaking pit furnaces will be put in, each hole measuring 4 feet 6 inches by 6 feet 6 inches. The shear for shearing the plates is being built

by the Morgan Engineering Company of Alliance, Ohio, and will have 136 inches gap and will be capable of cutting plates 120 inches long by 2 inches thick. This shear will be one of the largest in the country, and will be an exact duplicate of one recently furnished by the above firm to the Otis Steel Company, Limited, at Cleveland, Ohio. An electric traveling crane will span the soaking pit furnaces, while another will be built over the three-high train and engine for changing the rolls, and a third will be erected in the shipping department to permit convenient handling of the heavy material. All electric cranes are of the Shaw type, and are being furnished by Manning, Maxwell & Moore of New York. Electricity is

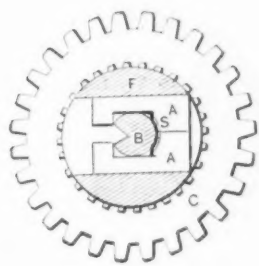


Fig. 1.—Section on Line X Y.

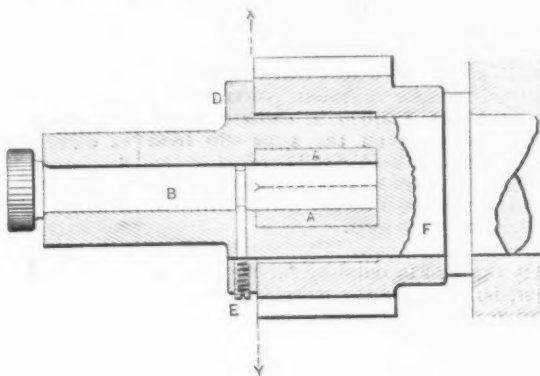


Fig. 2.—Longitudinal Section.

SEARS' INTERNAL RATCHET.

being used largely for power, and over 200 horse-power of dynamos will be required. When these additions have been completed, the Carbon Iron Company will have one of the best equipped and most modern plants in the country for the manufacture of ship plates, boiler plates, flange stock and heavy material. When in good running order, they expect to turn out from 275 to 300 tons per day. One of the contracts secured by this firm is to furnish the protective deck plates for the Government Cruiser No. 13. The officers of the Carbon Iron Company are: C. M. Raymond, president; H. W. Lash, general manager; and A. H. Keith, general agent.

The Troy Malleable Iron Works.

Within the next week or ten days ground will be broken for the new plant of the Troy Malleable Iron Works in West Troy, N. Y. Two sets of plans for the buildings have been prepared and are now being considered by the company's stockholders at Bridgeport, Conn. William Sleicher, Jr., manager of the works, looks for a speedy acceptance of one of the plans. The plans will be forwarded immediately and the work of leveling the site and making necessary excavations be begun at once. The new buildings will be of brick, the majority of them two stories high. They will be large enough to employ in the neighborhood of 400 men. The Albany, N. Y., branch of the works, which is to be consolidated with the Troy plant when the new works are completed, employs 125 men and the Ida Hill plant 200. These will be given employment at West Troy and seventy-five to 100 men additional. William Sleicher, Jr., manager, recently made an extensive tour of inspection through the West, for the purpose of obtaining the latest ideas and improvements used in the construction of malleable iron plants. A large number of these will be embodied in the new plant of the iron works at West Troy. It is expected that it will be in operation by fall.

Sears' Internal Ratchet.

The accompanying drawings show a cheap and efficient internal ratchet, designed by W. T. Sears of 1030 Green street, Philadelphia.

There are two pawls A and A, and as the rod B is rotated from the center position the segment cut from it, as shown in Fig. 1, allows one of the pawls to be pressed into engagement with the ratchet teeth by the thin, flat springs bent over rod B, also shown in Fig. 1. The other pawl is held out by the circular part of the rod. The points at each side of the segment are slightly flattened, thus holding the pawls in center position when thrown

there. The rod B can be extended through the shaft and worked from either end when desired.

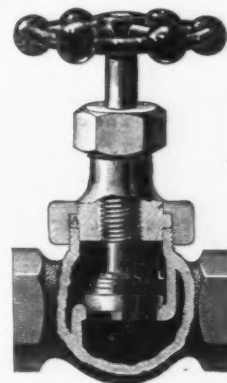
Low Prices on Cast Pipe.—We had occasion recently to comment on the very low prices being made on cast iron pipe. Within the past two weeks more orders have been taken at low figures. At Philadelphia the Radford Pipe Company secured half of a purchase made for the municipal water works and R. D. Wood & Co. the other half, the total consisting of 300 tons of 6-inch, 400 tons of 12-inch and 900 tons of 20 inch. The Addyston Steel and Pipe Company were the lowest bidders on 1700 tons of pipe for the World's Fair grounds at Chicago. They named \$20.24, delivered, for the straight pipe and \$38 for the specials, while the Radford Company named \$20.90 and \$39.50; Rhodes & Ramsey, \$20.95 and \$45; Detroit, \$21 and \$40; Dennis Long & Co., \$22.74 and \$49, and John H. Bass, \$45 for the specials. Competition is as keen as ever on all business now coming up.

A convention of delegates representing the various machinery trades met in the St. Charles Hotel, Pittsburgh, on Monday, the 7th inst., for the purpose of forming a national organization. The pattern makers, molders, machinists, boiler makers, blacksmiths, brass workers and steam fitters were represented. The new organization will be known as the National Federation of Machinery Constructors. It is said that the convention will represent about 25,000 men; all the trades engaged in constructing an engine will be represented in the organization. Among the delegates is Jno. H. Penton of Detroit, Mich., president of the Brotherhood of Machinery Molders. He states that the movement is one of the most important that has taken place for years in labor circles. The various branches of the trades, he claims, are organized locally throughout the country. The convention will endeavor to make a

compact body of all these organizations. One of the objects of the convention is to provide an apprentice system. It also will try to prevent overproduction and will advocate eight hours and the settlement of all difficulties by arbitration.

The Lunkenheimer Regrinding Globe Valve.

In the Lunkenheimer valve the hub, instead of being threaded direct to the body of the valve, is merely fitted into it plain and rests upon a flange which fits upon the upper edge of the opening, as shown. The hub is then secured by a nut that fits over the flange and is threaded to the outside of the body of the valve. The result of this arrangement is that the valve can be reground at any time with the greatest facility, because all that is necessary is to loosen the nut, remove the hub, place a little sand and soap under the disk, and then replace the hub, leaving the nut loose, so that the hub is free to turn with the stem during the grinding. A piece of wire is passed through a hole provided for that purpose in the lower end of the stem and disk, so that the disk will turn with the stem during the grinding, which, of course, it does not necessarily do when the valve is in use. The hub, being in place when the grinding is done, effectually centers the stem and holds it in proper place, so that the regrinding is done correctly. The valve can thus be readily ground while in position, and in many cases does away with the necessity for breaking connections. The disk is also



Regrinding Globe Valve.

easily replaced when required. These valves are made by the Lunkenheimer Brass Mfg. Company, Cincinnati, Ohio.

The official report of British trade for January shows a decrease of £687,000 in value of products exported, or 3.5 per cent., notwithstanding an increase of £4,744,000, or 14.1 per cent., in the value of imports. Among the most important changes is the decrease of 10 per cent. in quantity and 17.8 per cent. in value of exports of iron and steel, or £376,218 in amount. The greater part of this is due to the decrease of £260,452 in exports to the United States, most of it being in tin plates. In machines and engines the exports to this country decreased, but to other countries increased about 15 per cent.

James M. Swank has received from J. S. Jeans, secretary of the British Iron Trade Association, the following statistics of the production of iron and steel in Great Britain in 1891, compared with 1890.

Articles—Gross tons.	1890.	1891.
Pig iron	7,875,130	7,228,496
Bessemer steel ingots....	2,014,843	1,642,005
Bessemer steel rails.....	1,019,606	662,676
Open-hearth steel	1,564,200	1,514,588

The William Cramp & Son's Ship and Engine Building Company.

Whatever stagnation or depression may exist at the present time in most branches of the iron trade there is certainly no want of activity in the province of naval construction, as exemplified in the shipbuilding yard and engine works of the above company. A visit to their establishment reveals a perfect hive of industry—over 3000 hands busily employed on the construction of five ironclad warships for government, and on the repair and alteration of several vessels for private firms, destined for the more peaceful employment of trade.

The vessels are in every stage of progress, from the freshly-laid keel or bare ribs of the last new cruiser to the nearly-completed form of that splendid specimen of naval architecture, the United States steamer New York, which will shortly be handed over to the government.

Work has been going on busily all winter, and there is every prospect of a brisk year, several large contracts, both public and private, being in contemplation, so that a steady and continued flow of prosperity and advance for the company is assured.

As regards the war vessels the dates of their completion will depend entirely on the supply of the armor by the Government, as that portion of the structure is not included in the contract, but is merely put on by the builders as it is delivered. So far the supply is keeping pace satisfactorily with the progress of the vessels. The machinery for all is well forward.

The following brief notes relating to the ships of war now in the hands of the company will be of interest:

I.—United States Armored Cruiser New York.

Length, 380½ feet; breadth, 64 feet; draft, 23½ feet; tons displacement, 8150; indicated horse-power, 16,000; twin-screw, triple expansion vertical engines; speed, 20 knots; armor, 3½ inch belt, 10-inch turret, 6 inch deck; contract price, \$2,985,000; premium, \$50,000 for each extra ¼ knot; batteries, six 8-inch breech-loading rifles, 12 4-inch breech-loading rifles, eight 6-pounders, four 1-pounders and four Gatlings.

This vessel was launched in December last. She is well on toward completion, and will be finished within contract time, provided no delay occurs in consequence of non-delivery by government of necessary quantity of armor plating.

II.—Protected Cruiser No. 12.

Length, 412 feet; breadth, 58 feet; draft, 24 feet; tons displacement, 7,475; indicated horse-power, 21,000; type of engines, triple screw, triple-expansion, vertical; speed, 21 knots; armor, 4 inch; contract price, \$2,725,000; premium, \$50,000 for each ¼ knot extra; batteries; one 8-inch breech-loading rifle, two 6-inch breech-loading rifles, eight 4-inch breech-loading rifles, two 6-pounders and four 1-pounders. Will probably be ready for launching in June. The work remaining to be done before launching is the fitting of three tail shafts and screws and building the struts. Her machinery is very well forward, and boilers will be ready by the time she is floated.

III.—United States Battle Ship No. 1, Indiana.

Length, 348 feet; breadth, 69½ feet; draft, 24 feet; tons displacement, 10,298; indicated horse-power, 9000; speed, 15 knots; type of engines, twin-screw, triple-expansion, vertical; contract price, \$3,020,000; armor, 18 inch belt, 17 inch turret, 3 inch deck; batteries, four 13-inch

breech-loading rifles, eight 8-inch breech-loading rifles, four 6-inch breech-loading rifles, twenty 6-pounders, six 1-pounders and four Gatlings. Is framed and plated up to protective deck. Her armored shelf is completed and ready for diagonal arms forward. Most of her protective deck is already on the ship. This vessel will probably be the most formidable battle ship afloat.

IV.—United States Battle Ship No. 2, Massachusetts.

Dimensions, engines, armament and all details similar to No. 1. Is following closely after Indiana, and is almost in the same condition of preparedness. Both these vessels are to have a premium of \$25,000 on each ¼ knot over 15.

V.—Protected Cruiser No. 13.

Sister ship to No. 12, and almost identical in all respects, with the exception of a slight increase in boiler power, and a diminution of \$35,000 in contract price. She is building on the same slip from which the New York was launched in December. All her keel is laid, and frames up to protective deck for more than half the length of the ship.

Messrs. Cramps are just now almost entirely engaged in building for the Government, but have a few mercantile ships in hand for repair or alteration, notably the steamship Philadelphia of the Red D Line, plying between New York and Venezuela, which is now on the point of sailing on completion, having been cut in two amidships and lengthened 36 feet, thereby gaining an additional carrying capacity of at least 700 tons, as well as affording considerably increased accommodations for passengers. She has only been in dry dock for four weeks, and during that time, besides the above extensive alteration, her machinery has been thoroughly overhauled and forced-draft appliances put into her, which will probably conduce to a higher rate of speed. The vessel has been most wonderfully improved in every way by her visit to Messrs. Cramps' dockyard, and turns out almost like a new boat. It is worthy of note that no vessel has previously had a greater length than 25 feet inserted.

A large tank steamer, Beacon Lights, is now in dry dock being repaired, and new plates fixed on her bottom.

The steel bark Orion is at present under repairs for damages caused by a collision. Among other casualties her foremast is to be replaced, the damaged one, being of steel, had been bent in a sharp kink almost to the deck. This shows the advantage of steel masts in such a case. Had the spar been a wooden one there would most probably have been much more injury caused to the frame and rigging of the ship, and greater danger of hurt to those on board from splinters, &c.

I. P. Morris Company, makers of engines and boilers, the stock and machinery of which has been purchased by the Wm. Cramp & Sons' Shipbuilding Company, although the business is carried on under a separate management, have a full hand of business just now, and promise ample employment for their workshops for some time to come. They have several large contracts in hand for engines of the heaviest description—particularly for the Calumet and Hecla Copper Mining Company of Michigan, for whom they are constructing nine large engines to the designs of E. D. Leavitt—two have already been completed and shipped and the remainder are in a very advanced state. For the same company they are also building a number of boilers weighing about 90,000 pounds each, and two heavy hoisting drums 25 feet in diameter, with grooves for 5000 feet of rope 1½ inches diameter. They have also made some splendid castings of anvil blocks, to order, each weigh-

ing 70,000 pounds. These are among the most perfect castings, for their size, ever put out by any company.

Aluminum.

In a late number of the *Cosmopolitan* appears an illustrated article on "Aluminum—The Metal of the Future," by Joseph W. Richards, instructor in metallurgy, mineralogy and blow piping at the Lehigh University. The article is reprinted in part below:

Perhaps the most frequently asked questions regarding aluminum are: "What is it used for?" or "What will it be used for?" The first question may be answered with a reasonable degree of satisfaction, the second is a great deal easier to ask than to answer. Primarily, of course, the uses for which aluminum is particularly suited are those in which its lightness is of advantage. For instance, aluminum being only 2½ times as heavy as water, while iron is 7½ times, brass 8 times, copper 9 times, silver 10½ times, lead 11 times and gold 19 times as heavy, an aluminum frying pan would be only one-third as heavy as an iron one, an aluminum scale pan less than one-third as heavy as a brass one, an aluminum stewing kettle two-sevenths as heavy as a copper one, an aluminum dish one-fourth as heavy as a silver one, a sheet aluminum roof less than one-fourth as heavy as a leaden one and an aluminum watchcase hardly one-seventh as heavy as a gold one. So we may say in general that wherever an object is to be of a fixed size and it is desirable to have it made of metal and as light as possible, aluminum can be used with great advantage. The oft-repeated statement that aluminum will replace steel for bridges, steamships, machinery, &c., is a fallacy, because in these cases size is not a fixed quality, but strength is, and although aluminum is only one-third as heavy as steel, yet it is by itself only one-third as strong. For instance, to replace a steel tie rod in a bridge with an aluminum rod the latter would have to have three times the section of the steel rod in order to be as strong, and we would simply be replacing a small rod by a large one without any decrease in weight. However, it will be seen a little further on that the properties of some of the alloys of aluminum may yet put another face on this question.

It will not Corrode.

In addition to its lightness, another property which renders aluminum useful for many purposes is its resistance to many strong corrosive agents. Very noticeable, when compared with silver, is the fact that sulphurous vapors have not the slightest blackening effect on aluminum, while every one knows how unsightly they render silver or silver plating. This property gives aluminum a decided advantage over silver for all sorts of table ware and for ornamental work, such as sheet metal work or silvering for interior decoration. Again, the acids of the body have no effect on aluminum, so that surgeons use all sorts of instruments made of it with the greatest satisfaction as to cleanliness, as well as using it for suture wire, supports, tubes, &c. Apropos of such uses, it is interesting to note that when the Emperor Frederick had the operation of tracheotomy performed on his throat, a thin aluminum tube was the only kind of tube which it was possible for him to wear, those of rubber, silver, &c., either causing inflammation or discomfort from their weight, while the aluminum tube was totally unaffected by the pus and its weight was almost unnoticeable. On account of its resistance to nitric acid, plates of aluminum are very successfully substituted for the costly platinum plates in cer-

tain kinds of batteries. It is found that the new smokeless gunpowder rapidly corrodes and eats through the copper shells of the cartridges in which it is packed. The German Government has surmounted this difficulty by making the shells of aluminum, which, while resisting the corrosion, is also much lighter for the soldier to carry. Many tons of the metal are being put to this use.

In the Kitchen.

One of the most important uses of aluminum will be for cooking utensils. Here three important properties make it of value—lightness, resistance to corrosive action or rusting, great conductivity for heat. By virtue of the first the labor of lifting heavy kettles, &c., is considerably reduced; by virtue of the second the uten-

of all the pure aluminum made will be manufactured into kitchen utensils and tableware.

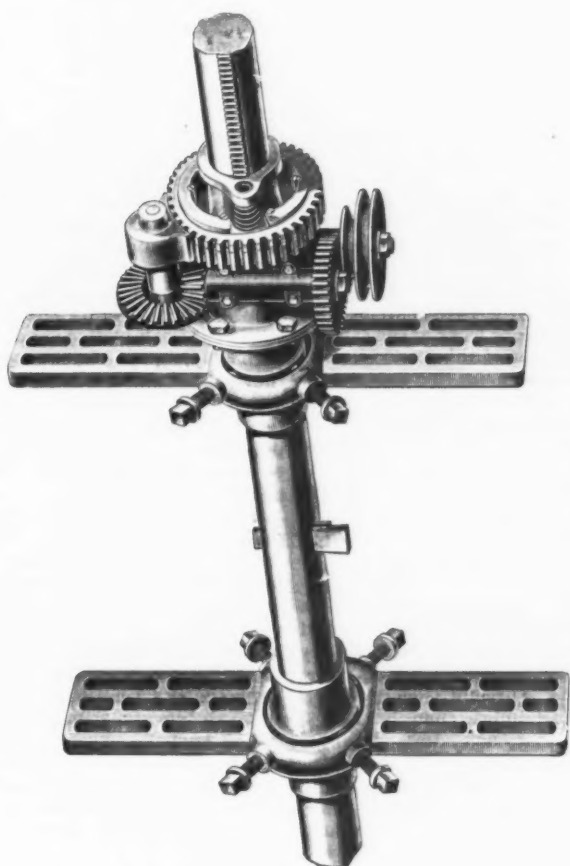
New Uses Every Day.

Almost every day some new uses for which aluminum is particularly suited come to light. Metal workers generally are very enterprising in trying the new metal, and with the present low price as a stimulant, larger and larger quantities of aluminum are being worked every day. One of the chief difficulties in the way of working aluminum has heretofore been the difficulty of soldering it. This was a hindrance to its use in many directions, but, quite recently, this problem has been completely solved by the writer's father, Joseph Richards of Philadelphia. Aluminum can now be soldered as easily and

minum is coming to be regarded as almost a necessity. Hundreds of pounds are used weekly for this purpose. If aluminum is added in very small quantity to ordinary zinc, it purifies it and greatly improves its appearance. If galvanized iron is made with zinc thus treated much finer-looking sheets are made. These last two processes have been patented recently by the writer's father.

The Halsey Portable Boring Bar.

The Halsey portable boring bar is adapted for boring out cylinders in position, or the bearings of large and heavy pieces which cannot conveniently be done on stationary machines. The boring bar is supported in the desired position by means of the slotted plates carrying the upper and lower bearings and is driven by belt-operating gearing, arranged as shown. The cut and feed are as heavy as can be accomplished on a stationary machine, and the work is performed with the required degree of accuracy. The heads of the bars can be applied to either a traveling bar or a traveling head with any change of feed. The feed can be thrown out of gear while the machine is in motion by operating a lever not shown in the cut. The bar or head can be advanced or withdrawn quickly by power or hand. With the boring heads are furnished a set of change gears, in order that the proper cutting speed of the tool can be maintained for different diameters of cylinders or holes. These bars are built in three sizes—2 $\frac{5}{8}$, 3 $\frac{1}{2}$ and 5 $\frac{1}{2}$ inches in diameter—by James T. Halsey of Twentieth sixth and Callowhill streets, Philadelphia.



THE HALSEY PORTABLE BORING BAR.

sils last a long time, while, even if some unusual combination of fluids did corrode them, there is the very comforting assurance to fall back on that there can in no case be any poisonous effect; by virtue of the third better cooking can be done. Perhaps the latter statement needs amplification, and I am constrained to add, for the satisfaction of any good housekeepers who may read this article, that Mrs. Richards has found her aluminum pie plates to bake the bottom crust better than ever before, and her aluminum saucepan to boil the vegetables with (expressing it approximately) half the fire. Again, aluminum has a remarkable power of holding its heat. Take two covered dishes, one of ordinary britannia metal and the other of aluminum, place them side by side on the warming rack and then together on the table. When the pewter dish has become cold the aluminum dish will be still quite hot. The writer thinks that as soon as the advantages of these kitchen utensils become generally known they will come into very general use, in spite of their costing about the same as copper ones. In a few years a large part

as firmly as copper or sheet iron, not yet as easily, however, as common sheet tin.

So far nothing has been said of the quantity of aluminum used up in making alloys. So many uses have been discovered for the pure metal, and it has taken so much space to tell of only part of them, that it may be surprising to read that the large part of all the pure aluminum made is melted with other metal and used in alloys. It has been discovered that many of the alloys of aluminum with other metals have very remarkable properties. For instance, 5 or 10 per cent. of aluminum added to copper forms a beautiful bronze of a golden color and as strong as ordinary steel. A small portion of copper or titanium added to aluminum makes it much stronger without increasing its weight perceptibly. It is these alloys which may replace steel for many engineering purposes, for they approach steel in strength and yet are very little heavier than aluminum. Again, a very small amount of aluminum has a decidedly beneficial effect on cast iron, so that many foundries are using it, while for the difficult process of making steel castings alu-

The iron manufacturers and builders have been organizing a league, which is said to represent about 90 per cent. of the companies in New York and Brooklyn and Jersey City. The organization has been incorporated under the name of the Iron League. Among the members are J. B. & J. M. Cornell, Post & McCord, Jackson Architectural Iron Works, Campbell & Van Tassel, Cook & Radley, Riverside Bridge and Iron Works, Wallace Iron Works, Union Iron Works, V. Moeslein, Poulson & Egers, Howell & Saxton, J. I. & J. F. Healey, J. G. & T. Dimond and William E. Lyon. The officers are: President, J. M. Cornell; vice-president, John Cooper of the Jackson Architectural Iron Works; secretary, B. E. J. Eils of Poulson & Egers, and treasurer, T. Dimond. The Executive Committee consists of W. H. McCord, J. J. Healey, William E. Lyon, J. M. Cornell, John Cooper and B. E. J. Eils. The manufacturers say that their fundamental idea is the same as that adopted by the employees. So that if the men employed on one building or in the shops of one company strike the league will back the concern in its fight. None of the companies will employ a man who has struck while in the employ of any other company.

The German Chancellor insists upon the construction of cruisers and corvettes, for the capture or destruction of merchant vessels in time of war, declaring that Germany would not conduct a war with privateers. Provision for their construction had been omitted from the estimates for the navy. He declared that a large number of workmen at Stettin would be discharged otherwise, and, necessarily, by the Vulcan Shipbuilding Company; and there were already 5000 destitute workmen in that city.

During the year ending June 30, 1891, Canada exported ore, matte and speiss containing 5,352,043 pounds of nickel.

WORLD'S FAIR NOTES.

Progress in Construction.

Seven of the World's Fair buildings are now so far advanced that they are fast assuming the appearance of finished structures. The rough carpentry work on them is practically done and the ornamental and finishing work is in progress. These buildings are the Woman's, Horticulture, Transportation, Mines, Administration, Forestry and Fisheries. Five more—the Government, Fine Arts, Agriculture, Dairy and Illinois State—are erected to the roof lines. The Electricity, Manufactures and Machinery buildings are being advanced rapidly.

Plaster work on the Mines Building is finished; the gallery railings are nearly completed and wire work is being set. Staff work on the south end of the building is nearly finished. All of the carpentry work and iron work on the Transportation Building is in place, except the central elevator tower. The panels of the arch around the Golden Door are in position.

All of the trusses of the Electricity Building, with the exception of the central diagonal trusses, are in position. 20,000 feet of lumber have been placed in position in the Horticulture Building during the week, making a total of 2,271,331 feet in the building. All the skylight glass is in position, also the canvas roofing on the north and central pavilions.

On the Administration Building 160,000 feet of lumber and 20,000 pounds of iron have been added during the week. Roofers are working on the northeast and northwest pavilions.

On the big Manufactures Building the week's record shows 100,000 feet of lumber placed in position, making a total of 9,797,152 feet to date, in addition to which has been received 444,000 feet of lumber and 168,000 pounds of carpenters' iron. The great traveler which is to be used for hoisting the immense girders spanning the central court is already 120 feet high and is yet less than half completed. This monster piece of work offers a landmark for miles around. When completed it will be used for putting in place the largest trusses ever made for architectural purposes, spanning 368 feet and rising to a height of 211 feet.

The iron work for the dome of the Fisheries Building is complete, and staff work is nearly finished in both annexes.

Ornamental staff work is being rapidly placed on the west end of the Agricultural Building and the roof trusses over the nave and transept are in position. During the week 109,874 feet of lumber and 41,000 pounds of iron have been added to this structure. The iron for the entire building is on the ground and the walls for the south half are about ready for the roof iron.

Work on Machinery Hall has been retarded, owing to non-delivery of iron, but the total amount of lumber placed foots up 30,000 feet, and iron 102,000 pounds. Most of the carpentry work has been to frame the annex superstructure. The second of the large arches is now in position.

Work on the Dairy Building is nearly finished, also on the Forestry Building. The latter is being temporarily used as a shop for the molders who are casting the big figures and groups for the Administration Building.

Buildings have now reached that stage in their construction when the most extreme care is necessary on the part of the men, many of whom are compelled to work at heights varying from 100 to 300 feet. In such weather as prevailed Wednesday and Thursday work at the height indicated was impracticable, and after the wind storm had abated it was anything but a

safe foothold along the narrow girders of the dome of the Administration Building or along the planks of the large traveler which rises a sheer frame work 150 feet from the great floor of the Manufactures Building. Despite the temporary cessation in certain kinds of work, progress has been considerable.

The entire area of the exposition grounds, including the north end of the improved portion of Jackson Park, has been fenced in. That portion which has hitherto been called "improved" has already lost all semblance to the claim to such a title. Its driveways, smooth grass plats and paths are torn up in every direction by trenches for sewer pipes and wires, or plowed out of semblance of a park by wheels of heavy drays employed in conveying material for the construction of the Fine Arts Building. Out toward the lake shore the low-lying stone summer house stands as a solitary reminder of the appearance of the park before the invasion of the exposition workers. At the southeastern corner of the north end of the park, where the maps show the site to have been set apart for Great Britain, a solitary watchman stands guard over the newly-sodded banks of the lagoon adjoining the Fisheries Building. So marked is the inactivity on this part of the site wherever buildings for foreign nations and states are to be erected that the Chief of Construction has taken steps to hurry along the representatives of such nations and urge them to commence work at the earliest moment. The result of this stirring up is expected to be shown in the course of a month or two, when work on several of the State buildings will be begun.

Midway Plaisance, where the rest of the unofficial buildings will be erected, is being quickly prepared for the builders. The work of leveling this portion of the site is making rapid headway.

Recent Official Action.

The Board of Control has extended the time for the announcement by States and foreign Governments as to whether they would accept the sites allotted them from May 1 to June 1. Director-General Davis thought the first date late enough, but the board decided that an additional four weeks could be granted.

The invitation by the California State World's Fair Board to the Board of Control, asking that a special session be held in San Francisco, was declined. It was regarded as being impracticable to meet on the Pacific Slope.

The Grounds and Buildings Committee confirmed the grant of space to the State of Louisiana recommended jointly by the Director-General and the Chief of Construction. It lies between the space for Kentucky and Mississippi, north and south in the spaces allotted to the States, north of the Fine Arts galleries.

Upon the recommendation of the Chief of Construction the contract for the three iron bridges over the lagoons was awarded to the Massillon Bridge Company of Massillon, Ohio, for the total sum of \$15,000.

Upon the recommendation of the Chief of Construction the contract for pipe and appurtenances was granted to the Addyston Pipe and Steel Company of Cincinnati, at the rate of \$20.24 per ton of 2000 pounds for straight pipe and \$38 per ton for special castings.

The Construction Department was authorized to contract for 1000 feet of hose reels and 50,000 feet of hose, with valves and nozzles, at a cost not exceeding \$50,000. This is for the completion of the fire protection upon the grounds. The construction department was also authorized to contract for sewers, for sidewalk and road drainage, at a cost not exceeding \$55,000.

The same department was also authorized to contract for material and construc-

tion of the terraces, steps and balustrades around the buildings and the lagoons at a cost not exceeding \$100,000.

The committee also awarded a contract for laying iron sewers, air pipes and appurtenances to T. C. Brooks & Co. of Jackson, Mich., for the sum of \$13,118.

Transportation Exhibits.

Chief Willard A. Smith has returned from a brief Eastern trip. At New York he met a committee of the officers of the New York Central Railroad with reference to their exhibit at the exposition. The Vanderbilt system of railways will make a large joint display. The details of this exhibit are to be arranged at a meeting to be held this week. The roads included will be the New York Central, West Shore, Lake Shore and Michigan Southern, Michigan Central, and the Chicago and Northwestern. The New York Central will rebuild the "De Witt Clinton" and in other ways give special attention to the historical aspect of the exhibition. The Pennsylvania system is planning to make the finest exhibit possible, and will spend a very large sum of money upon it. The details are not ready for publication, but it may be stated briefly that the exhibit will constitute a very complete school or exposition of American railway practice in itself. The officers of this company have taken the subject up in a broad spirit and will not allow the matter of expense to interfere with the completion and excellence of their display. The most competent person they can secure will be at once employed, and will give his whole time to their matters from now until the close of the exposition. Theo. N. Ely, superintendent of motive power, has the entire matter in charge.

The International Navigation Company of Philadelphia, Red Star and American line of steamers will make a fine exhibit in the transportation exhibits building. Chief Smith met the directors of the company in Philadelphia and examined their plan.

Among the novelties for which space has recently been asked in the transportation exhibits department are electric carriages, tricycles, &c., for use on common roads. The makers believe that horses will in time be entirely supplanted by electricity. In the saddlery and harness department the actual manufacture of whips will be carried on during the fair, the machinery employed being very intricate and interesting.

Tariffs on Advertising Matter.

For a long time the Publicity and Promotion Department was hampered in its work in foreign fields by the existing tariff regulations of many nations. These regulations levied a substantial tax on all importations of colored plates, printed matter, stereotypes, &c. The fair has to be advertised abroad as well as at home, so the department paid duties on the advertising matter it sent out to European and other nations for some time.

One day Assistant Chief R. E. A. Dorr suggested to Major Handy that possibly some foreign nations might be induced to remit the duty on World's Fair advertisements if the matter was put before them right. Major Handy thought possibly they might and work was promptly begun along that line. The result is that to day exposition literature, plans, maps, electro-types, wood cuts, engravings, &c., colored or of whatever sort, forwarded from the Department of Publicity and Promotion, are entered free of all duties in the following-named countries: Great Britain, Belgium, China, Netherlands, Serbia, France, Guatemala, Ecuador, Liberia, Nicaragua, Sweden, Norway, Hayti.

Certain conditions have to be complied with, especially one to the effect that all

such matter be directly assigned to the United States legation in the following countries: Spain, Roumania, Italy, Portugal, Switzerland, Denmark and Austria-Hungary.

Illinois Geological Exhibit.

Prof. Joshua Lindahl of Springfield, State Geologist, is sending out to the owners of coal mines and quarries a circular asking their co-operation in making a geological exhibit at the World's Fair. Some time ago Professor Lindahl issued a circular to coal operators. About 130 responses have been received. Of this number only seven coal miners express a willingness to co-operate in the manner suggested. The plan originally proposed was to have an analysis of the coal from a number of the mines of the State. At a recent meeting of coal operators held here this plan did not meet with general approval, and it is uncertain to what extent it will be carried out.

The plan Professor Lindahl now proposes is to place on exhibition a miniature

Fair," said Mr. Madden. "The resolution which the Legislature adopted says that as the State has been asked to appropriate money for a display which will necessarily be chiefly that of her mineral wealth, and as large sums have been devoted to the geological examination of this wealth, the development of which in Kentucky, as well as in many other States, gives employment to a large number of deserving miners, their Senators and Representatives in Congress and the Kentucky Commissioners are urged to use all means in their power to secure the use of coal.

"The resolution claims in addition that the substitution of oil would be injurious to health, to the safety of property, to the pleasure and comfort of visitors, and would work an irreparable hardship and injury to a class of toiling citizens whose daily life is a constant peril."

British Metallurgy.

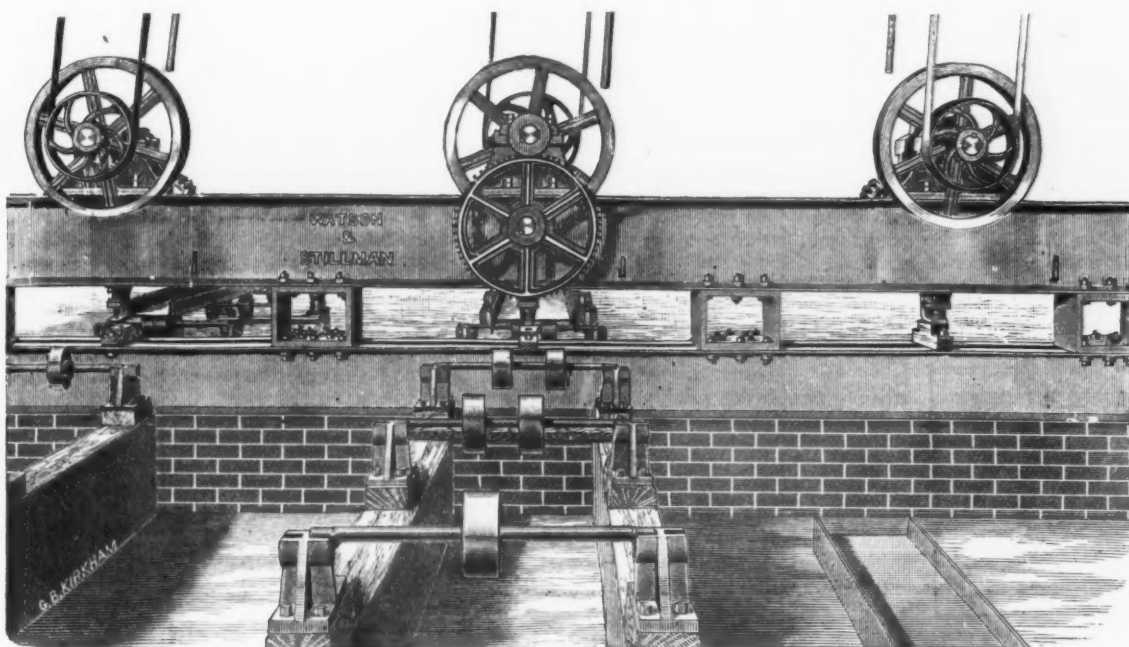
The British Royal Commission for the Chicago Exposition is endeavoring to form a typical collection, illustrating British

on the lake front and a bazaar on the Midway Plaisance. On the north end of the wooded island it will make a prominent exhibit in the way of a temple stored with Japanese art.

A convention of the representatives of the manufacturing, mining, railroad, marble, timber and industrial enterprises and interests of East Tennessee is called to meet in the public hall of the court house in the city of Knoxville, Thursday, March 24, at 10 o'clock, a.m., for the purpose of considering and taking action as to ways and means for providing for an exhibit.

Chief Fearn has submitted his monthly report to Director General Davis showing that 38 nations and colonies have appointed World's Fair Commissioners, who are now at work in the interest of the exposition. Eighteen other countries have accepted the invitation to participate, and from 21 others exhibits are expected.

Lieutenant Baker of the Marine Section of the Department of Transportation has



TRIPLE ARCHITECTURAL IRON PUNCH.

section of each vein of coal worked in this State. There are 16 veins of coal in Illinois, but only eight of them are worked, and these veins will be represented. Professor Lindahl, however, thinks that in order to give more definite information as to the value of the coal, &c., analysis will be necessary. The circular now being sent out has reference to the stone and clay, as well as the coal exhibits. It is proposed to exhibit dressed stone, and also to have a chemical analysis made of all stones and clays available, the analysis to be made at a nominal cost by the professors in the charge of the laboratories at the University of Illinois at Champaign. All the exhibits after the close of the exhibition are to be preserved in the Museum of National History at Springfield.

Kentucky Defends Coal.

There is going to be a lively fight over the question whether coal or oil shall be the World's Fair fuel. This is the opinion of Charles J. Madden of Kentucky, who was in Chicago last week, and who based his predictions upon a joint resolution which passed the Kentucky Legislature last week. The same action, he said, would be taken by at least a half dozen other States.

"Kentucky is in earnest in demanding that coal shall be used as fuel at the World's

metallurgy, for the British section, and it is now applying to owners and managers of metallurgical works, asking for specimens of each of their principal metallurgical products, and also for specimens illustrating various processes. Dr. E. J. Ball, the instructor in assaying at the Royal College of Science, South Kensington, has undertaken to classify and arrange the collection, which, when complete, will doubtless be fully illustrative of the condition of metallurgy in the kingdom. At the close of the exposition the collection will be presented to an American museum.

Items.

The Joint Committee on Ceremonies awarded the contract for the construction of 24 floats, to be used on the occasion of the dedicatory ceremonies in October, 1892, to Shober Carqueville of Chicago. The floats are to cost \$3800 each, making a total of \$91,200.

The Director-General has granted to S. Tegima, Special World's Fair Commissioner from Japan, approximately 150,000 square feet of space on the exposition grounds and in the buildings. This is nearly 3 acres and about 2 acres less than England was accorded. Japan will make a display in all the principal buildings, and in addition have a Japanese tea house

secured a promise from the Detroit Dry-Dock Company for an exhibit of a perfect model in stucco of the entire shipbuilding plant of the company, both at its Detroit and Wyandotte yards.

Triple Architectural Iron Punch.

Watson & Stillman of 204 East Forty-third street, New York, are building a wrought-iron frame triple punch for the rough work which has to be done by unskilled men in structural iron work, and which is not so liable to break with an extra hard beam as when a cast-iron body is used, unless extra heavy. As is seen, the frame work is formed from one pair of heavy 20 inch steel beams, bottom and top, thoroughly built together with the plunger and guides situated between the upper pair. A small lever placed near the lower edge of the upper beam serves as a stop motion of the plunger. In order to show both sides of the tool, the center punch has been, in the engraving shown, turned around. The throat is 68 inches between uprights by 14 inches high, and there are no projecting parts to prevent freedom of movement of material. One of these machines has been running constantly for two years without showing any weakness.

The McGrath Ratchet Drill.

The reciprocating movement of the operating handle in either direction is utilized to turn the McGrath ratchet drill. The holder is mounted to rotate in a hollow threaded shaft containing a longitudinally movable spindle, which, at its upper end, rests either directly against the usual angle iron, or a support, fixed to the work, and which also restrains the hollow shaft from rotating. An operating handle is journaled about the drill holder, as shown in Figs. 1 and 2, the handle carrying two oppositely-acting pawls, shown in the sections Figs. 3 and 4, which engage two ratchet-tooth wheels, one of

tube is rotated, with the grooves in the sleeve may be so adjusted as to give any desired feed to the drill.

With this construction there is no lost motion, since the drill is operated at each stroke of the handle. This drill is placed on the market by John F. McGrath of Taunton, Mass.

San Francisco News.

The weather still continues favorable for the crops, and the auguries for the future of business in iron, hardware and agricultural implements are of the very brightest, especially is this the case as far as agricult-

that the best they can do is just to keep the shop running; and yet they have one of the best plants in America. A little while ago the Union Iron Works bought out the Pacific Foundry, principally the property of Ira P. Rankin, a pioneer and a gentleman who has passed the Psalmist's limit, and since the purchase it is said that they have not had a new order. Four men are at work where there should be over 100, as the Pacific is one of the largest foundries in the city. All this is the reverse of encouraging and may be traced to Eastern competition, the molder's strike and the dull times of a year past.

A new corporation of a most important character has been formed to manufacture

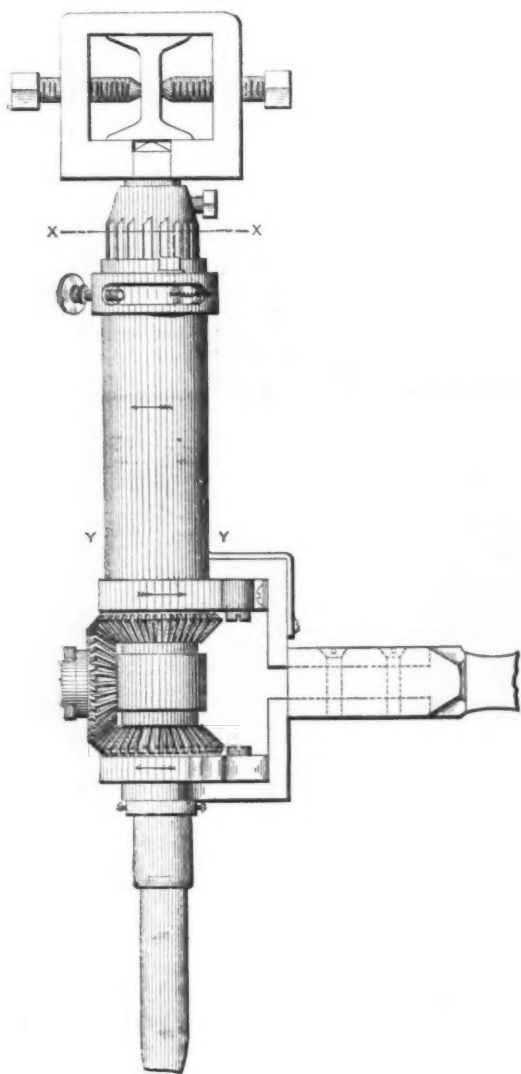


Fig. 1.—Elevation.

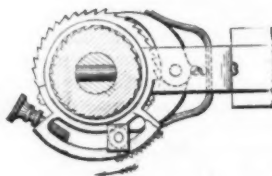


Fig. 3.—Section on X X.

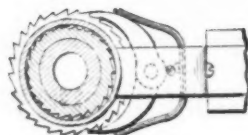


Fig. 4.—Section on Y Y.

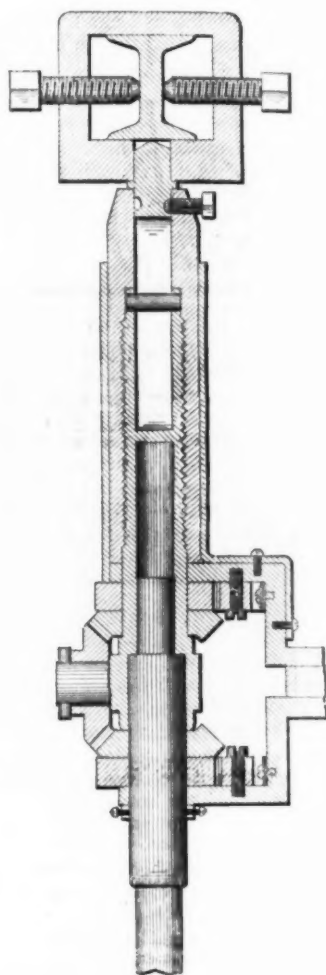


Fig. 2.—Vertical Section.

THE McGRATH RATCHET DRILL.

which is fast on the drill holder and the other loose on the hollow shaft. Secured to the ratchet wheels are bevel gears arranged facing each other and engaging with a common intermediate bevel gear loosely mounted on a stud projecting from the hollow shaft. Movement of the operating lever in either direction will cause one or the other of the pawls to engage its ratchet wheel and act to turn the drill holder and drill in the same direction. Threaded upon the hollow shaft is a sleeve which, when rotated about the shaft, will move the shaft longitudinally to feed the drill to its work. In the outer surface of the sleeve are longitudinally cut ratchet teeth which are engaged by a pawl carried by a tube surrounding the sleeve and partially rotated by the reciprocation of the handle. The engagement of the feeding pawl, as the

ural implements are concerned, measurably so in hardware and in merchant iron. As to pig iron, especially with the competition in Alabama iron now inaugurated, the prospects are not excessively bright. To single out some individual firms, Baker & Hamilton, in agricultural implements, report a better trade now than a year ago, while Truman & Hooker say that so far they have done twice the business they did for the same time last year. Our shipyard is, of course, as active as it can be, but our foundries are for the most part with very little to do. The Union and the Risdon, and possibly one or two others, are exceptions, but some of the very oldest growl fearfully. For instance, the National that used to ship heavily North and South and do a good export trade say that they are now principally engaged in repairing, and that competition is so close

guns, plates, armor, bars, shot, shell and forging, and to conduct all business incident to such manufacture. The capital stock is \$2,000,000, of which \$535,000 has been subscribed by the directors. Irving M. Scott, H. S. Scott and John O'B. Gunn contribute \$100,000 each of the capital stock. These gentlemen are also directors and leading stockholders in the Union Iron Works and the shipyard. Henry L. Dodge, a banker, Geo. C. Perkins, of the Pacific Coast Steamship Company, and Millen Griffith, his partner, subscribed \$50,000 each. L. B. Benchley, late manager of the Pacific Rolling Mills and one of the original projectors of it, and C. A. Spreckels, one of the celebrated firm of J. D. Spreckels & Brothers, put in \$20,000 each. James B. Stetson, the president of the Traffic Association, and Chas. Holbrook, his partner, are down

for \$10,000 each. These are all men of mark in the community, whose names inspire confidence. Two million dollars will be expended in plant, &c., and 2000 men employed. The works will be at Baden, or New South San Francisco, the new suburb which is now being built up by Chicago and local capitalists. With the gun works or gun foundry at Benicia, where it will probably be, there will be 4000 men employed. You can readily imagine what an important addition this will be to San Francisco's army of industrial workers.

Our importations of tin plate of late have been very large. To date, 127,699 boxes by sea. Most of what has arrived has been sold. In fact, there is little or none at present in first hands but the effect of such heavy importations has been naturally to force down the market to \$6, spot. Pig tin is dull at 21 cents.

A most important arrival of pig iron has come to hand during the week—931 tons of Alabama, per Yorktown. This is but the first of a considerable number of shipments, as 3000 tons in all has been purchased by our foundries here. English and Scotch, however, has sold at \$23, and, indeed, as low as \$20 per ton, though nominally much higher. We use here every year, according as business is dull or active, from 12,500 to 20,000 tons of pig iron, that is, foreign pig, per annum, and counting everything from 17,000 to 24,000 tons, with the new works now in prospect we will use much more.

Rail imports continue free. For the two weeks just closed, 16 cars of iron, 18 cars of steel, 2 cars of pipe, 8 cars of machinery, 8 cars of hard ore, 1 car of stoves, 7 cars of agricultural implements, 2 cars of safes, 5 cars of wire, 2 cars of wagons, 1 car of stamped ware, 1 car of tires, 1 car of pulleys, 1 car of chain—total, 73 cars—and 40,136 pounds zinc, 1068 plates spelter and 4 kegs nails.

General imports by sea have been of large volume.

Yachts.

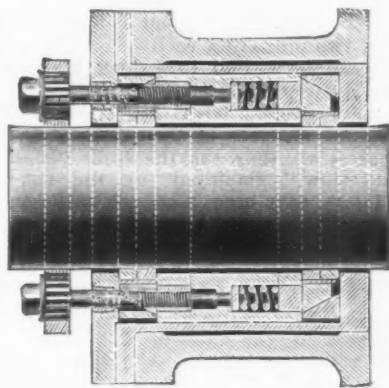
Our Government recognizes no vessel as a yacht unless she has a license as such. With such a license, she is entitled to go from port to port of the United States without clearing or entering at the custom house, and by sea to foreign parts without clearing. On her return from a foreign port she must be entered. This is to bring her under the observation of customs officers. Yachts of other countries must be entered on arrival from abroad. After that, if they belong to an organized and incorporated yacht club of any country which extends like favor to yachts of the United States, they may proceed from port to port of the United States and abroad again, without making clearance or entrance.

Pleasure vessels which have had alien owners, but have become the property of citizens, have a nondescript status. They do not come under the exemption, by construction of the Treasury Department, from tonnage duty, as yachts. At one time they were treated as liable to the duty, and to obligation to make entrance and clearance. Afterward they were ignored, on the ground that they were not engaged in trade. The latest decisions of the Treasury Department hold them to be liable to tonnage duty of fifty cents per ton, on arrival from a foreign port. The Department also held them liable to light money, even if they had a certificate of the citizenship of the owners, and of the record at a United States custom house, of the bill of sale to such owners. This, however, the Federal court has disapproved; and, on the contrary, decided that such a certificate was a regular document issued at a custom house proving the ves-

sel to be American property, within the meaning of Section 4226 Revised Statutes of the United States.

Houston's Adjustable Metallic Packing.

This metallic packing consists of two sets of packing rings placed at the extremities of the packing box, the rings being either cast iron or bronze. In order to break the joints parallel with the axis of the rod, two rings are necessary. To facilitate examination and renewal the rings are cut in halves only. Surrounding each set of packing rings are thin flexible rings cut to permit of annular adjustment. Their object is to break the joints on the circumference of the packing rings. Around the thin rings are two rings of beveled section, the inner one being cut into segments to allow of annular adjustment of the packing rings. The outer rings are solid, and smaller in diameter than the case containing the whole, which admits the packing rings to follow the rod laterally, thus preserving the accuracy of both the rod and packing. Against the segmental wedge rings bear solid annular rings having bolts screwed through the outer one; they are connected together by gearing, so that by turning



Houston's Adjustable Metallic Packing.

them the rings are forced apart parallel, bearing with them the segmental wedges and by reason of the thrust taken on the outer solid rings are directed radially toward the center of the rod, bringing the packing rings in contact with the rod simultaneously with equal force over the entire circumference. This packing is made by John B. Houston, 24 Hawthorne street, San Francisco, Cal.

At their meeting in Chicago last week the General Freight Committee of the Central Traffic Association decided that rates on manufactured iron and steel articles between all points in the territory of the association may be made on the basis of 17½ cents per 100 pounds in less than carloads, and 15 cents per 100 pounds in carloads, Pittsburgh, Pa., to Chicago, Ill., to take effect March 23, 1892, but not to extend beyond September 30, 1892. A slight reduction was also made in the rates on pig iron between points in the territory of this association, to take effect and expire the same dates. This reduction in freight rates is made earlier than usual, probably in anticipation of an early opening of lake navigation.

The Walburn-Swenson Mfg. Company of Fort Scott, Kan., has erected a small experimental concentrating plant, with a capacity of 10 to 20 tons per day, so that they are in a position to make practical tests by concentration.

Tempered Copper.*

So-called tempered copper has been put upon the market by the Eureka Tempered Copper Company, samples of which were examined at the Versuchsanstalt für Bau- und Maschinen Material with the following results, the investigation having been made by P. Kirsch.

I.—CHEMICAL COMPOSITION.

	Ordinary copper.	Tempered copper.
	Percent.	Percent.
Silver.....	0.026	0.025
Copper.....	99.990	99.981
Tin.....		
Zinc.....		
Iron.....	0.082	0.088
Aluminum.....		
Arsenic.....	0.046	0.042
Phosphorus.....	0.017	0.018
Total.....	100.101	100.154

As will be seen from the foregoing analyses, the difference of tempered copper from copper of ordinary commercial quality, as far as its composition is concerned, is but slight.

II.—MECHANICAL PROPERTIES.

The coppers of which the analyses are given above were mechanically tested, with the following results:

	Strength in kgs.* per sq. mm.	Elastic limit in kgs. per sq. mm.	Extension. Per cent.	Contraction in area. Per cent.
Tension, tempered.....	18.14	8.05	18.0	26.7
Tension, tempered.....	19.58	7.67	23.5	36.6
Tension, untempered.....	16.30	7.13	21.0	36.6
Tension, untempered.....	17.17	7.08	22.5	35.7
Compression, tempered.....	30.38	10.42	28.0
Compression, tempered.....	37.30	9.93	26.8
Compression, untempered.....	33.12	9.62	27.4
Compression, untempered.....	36.21	11.30	27.6

* 1 kg. per sq. mm. = 1425.45 lb. per sq. in.

The tests and analyses quoted above were carried out in America, and are quoted for the sake of comparison with those performed at the Versuchsanstalt, which were as follows:

(a) *Modulus of Elasticity.*—The modulus of elasticity determined on a specimen tested in tension was 10,050 kg. per square millimeter. The modulus determined by compression tests was 2930 kg. per square millimeter, with a load of 2.5 kg. per square millimeter, and 1020 kg. per square millimeter with a load of 7.2 kg. per square millimeter.

(b.) Tensile Strength.

Test pieces used.	Kilograms* per square millimeter.
Sheet, 0.11 mm. in thickness.....	50.2
Sheet, 0.13 mm. in thickness.....	67.9
Sheet, 0.55 mm. in thickness.....	56.8
Sheet, 0.64 mm. in thickness.....	53.4
Sheet, 1.19 mm. in thickness.....	52.3
Wire, 0.50 mm. in diameter.....	31.8
Wire, 0.80 mm. in diameter.....	72.0
Wire, 1.65 mm. in diameter.....	52.0
Wire, 2.60 mm. in diameter.....	50.0
Wire, 4.20 mm. in diameter.....	47.6
Rod, 87 mm. in diameter.....	19.0

* 1 kg. per sq. mm. = 1425.45 lb. per sq. in.

The last-named specimen had an elastic limit of 8.1 kg. per square millimeter. A compression test was made in which deformation began when the load had reached 8.1 kg. per square millimeter. The load could be increased to 219 kg. per square millimeter without producing cracks, although the test piece, which was origi-

* *Mittheil. Techn. Gewerbe-Museums*, 1891, 261-267, through *Journ. Soc. Chem. Ind.* for February, 1892.

nally 30 mm. in height, had to be shortened to 7.8 mm.

(c) *Ductility*.—The extension given by the sheet varied between 0.2 and 2.0 per cent., while that of the wire was 3.1 and 0.2 per cent., and that of the rod 13.1 per cent., while the contraction of area at the point of fracture of the latter was 33 per cent. From these tests, as well as by winding tests with the wire, it appears that the material possesses great ductility. The foregoing series of tests show that the tempered copper possesses properties that distinguish it from the ordinary material, its strength in pieces of small section being noticeably high, although that of larger test pieces is by no means remarkable, as it shows the tensile strength of only 19 kg. per square millimeter, while ordinary commercial copper gives 20 to 25 kg. per square millimeter. Castings made of it are of good quality, and its electrical conductivity is high.

American Armor.

[With Supplement.]

The Indian Head armor-plate trials, carried out on October 31 and November 14 of last year, are the most important tests yet conducted in any country. Full accounts of the results were published at the time and a number of sketches appeared in the public prints which professed to indicate the effect of the shots. They were rough and practically valueless, and for that reason *The Iron Age* declined to print similar drawings which were submitted at the time. Through the courtesy of the Naval Ordnance Bureau we have come into possession of the first full set of photographs given out, and present in the accompanying plate a series of photographs so grouped that the effect of the firing upon the different plates may be studied at a glance, and comparisons may be readily made. We have indicated by parentheses which photographs belong together, as representing the different plates. Their position is as follows: Fig. 1 and Fig. 2 are the back and front views of the Carnegie low-carbon nickel steel plate, while Figs. 3 and 4, at their side, show the same kind of plate subjected to the Harvey treatment. Fig. 5, placed at the side of Fig. 3, is a side view of the same plate with the bolts attaching the plate to the backing clearly shown. Beyond them Figs. 6 and 7 represent the Bethlehem low-carbon steel plates also treated by the Harvey process. Fig. 8, in the center of our plate, giving the side view. Figs. 9 and 10 show the effect of the firing on the Bethlehem high-carbon nickel steel plate. Figs. 11, 12 and 13, which belong together, deal with the Bethlehem high-carbon nickel steel Harvey plate, which was given first place by the board. Finally, Figs. 14 and 15 show the high-carbon nickel plate made by Carnegie, Phipps & Co.

By unanimous decision the board placed the plates in the following order of merit:

- No. 1. High-carbon nickel steel Harvey plate, by Bethlehem (Figs. 11, 12 and 13).
- No. 2. High-carbon nickel steel, by Bethlehem (Figs. 9 and 10).
- No. 3. High-carbon nickel steel, by Carnegie, Phipps & Co. (Figs. 14 and 15).
- No. 4. Low-carbon nickel steel, Harvey, by Carnegie, Phipps & Co. (Figs. 4 and 5).
- No. 5. Low-carbon nickel steel, by Carnegie, Phipps & Co. (Figs. 1 and 2).
- No. 6. Low-carbon steel, Harvey, by Bethlehem Iron Company (Figs. 6 and 7).

With the photographs before them, the readers of *The Iron Age* will be able to follow the reasoning of the Armor Board and of the Secretary of the Navy.

The Opinion of the Board.

The right side of plate No. 1 (Figs. 11, 12 and 13) showed very remarkable qual-

ities. The two projectiles which struck that side penetrated not more than 7 inches, the head remaining in the plate, completely filling the hole, and with the appearance of having been welded to the surrounding metal, while the body was shattered into many fragments.

No cracks were made on that side of the plate.

The back of the plate on that side showed no disturbance except a hardly noticeable swelling on the surface.

It is to be noted that the upper part of plate No. 6 (Figs. 6, 7 and 8), Harveyed, showed qualities resembling those of the right side of No. 1, while, on the other hand, plate No. 4 (Figs. 3, 4 and 5), likewise Harveyed, was totally lacking in such characteristics.*

Plate No. 2 (Figs. 10 and 12) showed a great degree of uniformity as well as resistance to penetration.

The small penetration of the 8-inch shot in plate No. 3 (Figs. 14 and 15) is, in the opinion of the board, due to the excessive upsetting of the projectile.

All of the armor plates were more or less cracked through, but only two, Nos. 3 (Figs. 14 and 15) and 6 (Figs. 6, 7 and 8), badly, and these two plates alone showed cracking before the fifth shot. Plates Nos. 1, 2 and 3 (Figs. 11, 12 and 13, Figs. 9 and 10 and Figs. 14 and 15), kept out all the projectiles; No. 4 (Figs. 3, 4 and 5), was perforated by one, and Nos. 5 (Figs. 1 and 2) and 6 (Figs. 6 and 7) by two projectiles each.

It will be noticed that the "high-carbon" plates show better results than those of "low carbon," but is believed that the chemical analyses of the plates now in progress will show that the words "high" and "low," employed by the manufacturers, have been used arbitrarily and have but little value for purposes of comparison.

The Holtzer and Firminy projectiles were part of the lot used at the Annapolis armor trials of last year.

Comparing the plates of this trial with the Creusot steel and the Creusot nickel steel plates of the Annapolis trials of September, 1890, the board is of the unanimous opinion that—

No. 1 (Figs. 11, 12 and 13), the high carbon nickel steel Harvey plate furnished by the Bethlehem Iron Company, and No. 2 (Figs. 9 and 10), the high-carbon nickel steel plate furnished by the Bethlehem Iron Company, are superior to the Creusot steel and nickel steel plates of last year.

In this connection it should be considered that the firing at this year's trial was more rapid than at last year's, and that the interval between the fourth and fifth shots at each plate was about two hours instead of four days as then. At this trial the plates were still "singing" from the blows of the 6-inch when they were struck by the 8-inch projectiles.

Opinion of the Secretary of the Navy

is summarized as follows:

"A series of tests made during the spring and summer confirmed the conclusions formed at the Annapolis trial as to the superiority of nickel steel and the Department accordingly decided to adopt it and made arrangements with the contractors looking to that end.

"It remained, however, to give a thorough trial to the first armor of domestic manufacture before beginning to place it upon the vessels, and for this purpose it was decided to order typical plates, which should be made the subject of an experimental test. This trial was to ascertain two points: 1, whether our domestic

manufacturers could produce an armor that would stand competition with the material manufactured abroad, and, 2, which of the various modes of treatment suggested would give the best results. In reference to the latter point the questions to be considered were the relative merits of rolling and forging in the manufacture, and the effect of a new method of treatment named from its inventor, the Harvey process, designed to harden the surface of the plate while retaining the toughness of its body.

"Of the six plates tried, three were furnished by the Bethlehem Iron Company and three by Carnegie, Phipps & Co.

"In these trials, which took place at Indian Head on October 31 and November 14, the plates were subjected to tests more severe than had ever been applied to any foreign Government trials. Four shots were fired at each plate from a 6-inch gun with an impact velocity of 2075 feet per second, and an energy of 2988 foot tons, using the Holtzer projectile of 100 pounds. One shot was then fired at the center of each plate from an 8-inch gun, with an impact energy of 4988 foot tons, using Firminy and Carpenter projectiles of 210 and 250 pounds weight, respectively. The plates were placed normal to the line of fire.

"The results of the trial were in the highest degree satisfactory. Each of the six plates manufactured in this country was superior to the English compound plate, while the nickel Harvey plate and the high-carbon nickel plate were superior to all the foreign plates of the Annapolis trial. They may, therefore, be pronounced in advance of the best armor hitherto manufactured in Europe.

"Further light was thrown upon the question of the relative merits of all-steel and nickel-steel armor, and any doubt which may have remained upon that subject was finally set at rest. Of the three plates made by Bethlehem two were of nickel steel, one treated by the Harvey process, the other not, and the third was of all steel, Harveyed (Figs. 6, 7 and 8.) Both the nickel plates proved to be far superior to the all steel Harveyed plate, notwithstanding the advantages which it may have derived from the special treatment, and both proved superior to the French all-steel plate tried at Annapolis.

"A third nickel plate, manufactured by Carnegie, under the rolling process, also showed a marked superiority over the all-steel plate of this year, and both it and the corresponding Bethlehem plate manufactured under the hammer showed a capacity of resistance to perforation fully 10 per cent. greater than that of the French all-steel plate. In this respect the results furnished by the two American plates manufactured by the different processes (forging and rolling) proved to be remarkably uniform, the 6-inch shots that were fired at them differing in penetration but an inappreciable amount.

"The trial thus definitely establishes the fact that armor of excellent quality may be produced by the rolling process, and that forging by means of the hammer, the greatest source hitherto of expense in manufacture, is no longer to be regarded as an absolute necessity. The importance of this fact can hardly be overestimated, for it raises a probability that within a year or two the armor-producing capacity of the United States may be quadrupled in case of necessity, and that if we had 10,000 tons to let and could give 18 months from date of contract to commence delivery, the cost of manufacture would be reduced from 25 to 33 per cent., while the work hitherto confined to two firms would be thrown open to a large number of competitors.

"Finally, the trial shows that the high-carbon nickel Harvey plate is undoubt-

* The method of tempering at Bethlehem differed from that at Pittsburgh.—Note by Departmental authority.



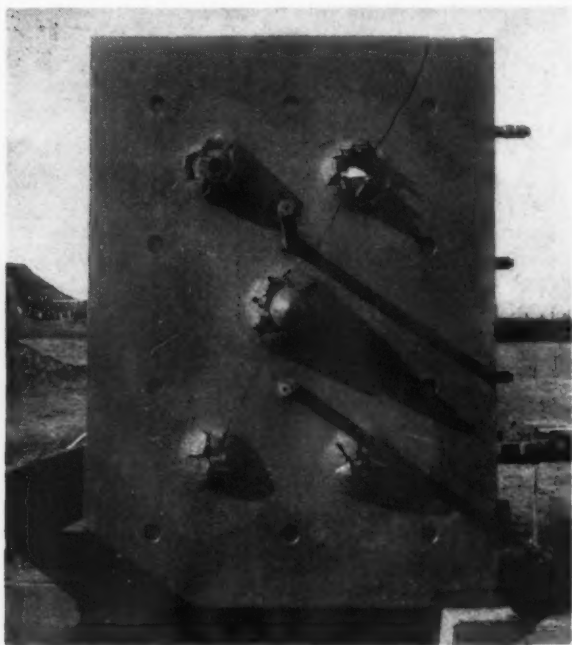


Fig. 1.—Low-Carbon Nickel Steel, Carnegie (back).

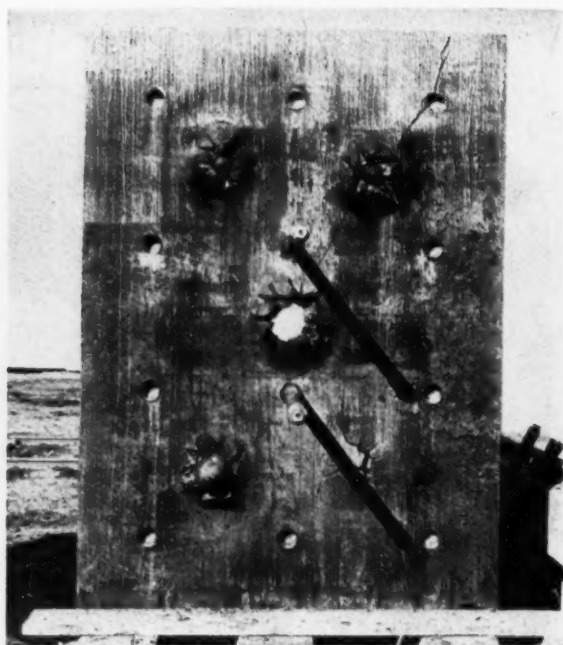


Fig. 3.—Harvey Low-Carbon Nickel Steel, Carnegie (back).



Fig. 5.—Harvey Low-Carbon Nickel Steel, Carnegie (back).

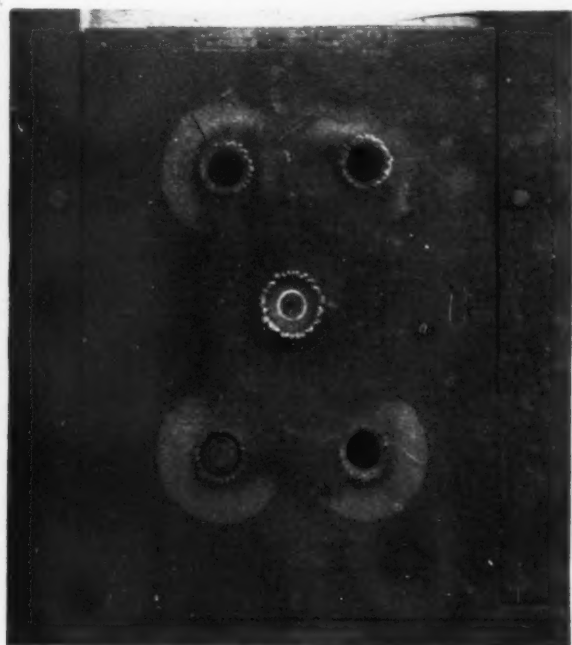


Fig. 2.—Low-Carbon Nickel Steel, Carnegie (face).

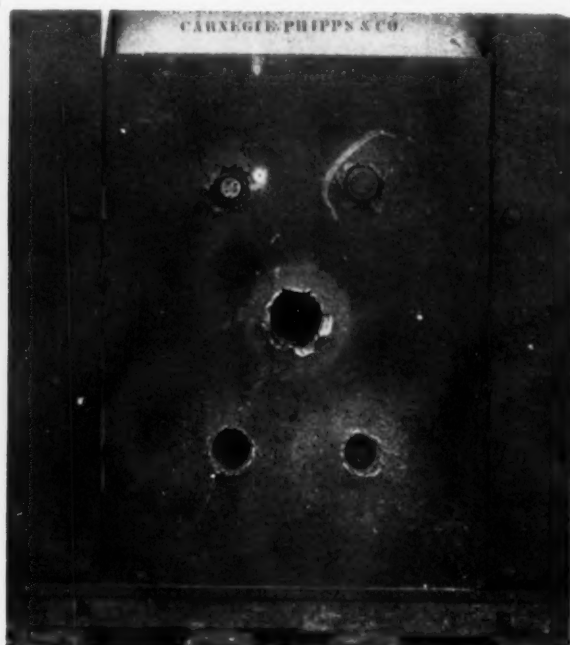


Fig. 4.—Harvey Low-Carbon Nickel Steel, Carnegie (face).



Fig. 8.—Harvey Low-Carbon Nickel Steel, Carnegie (face).



Fig. 11.—Harvey High-Carbon Nickel Steel, Bethlehem.

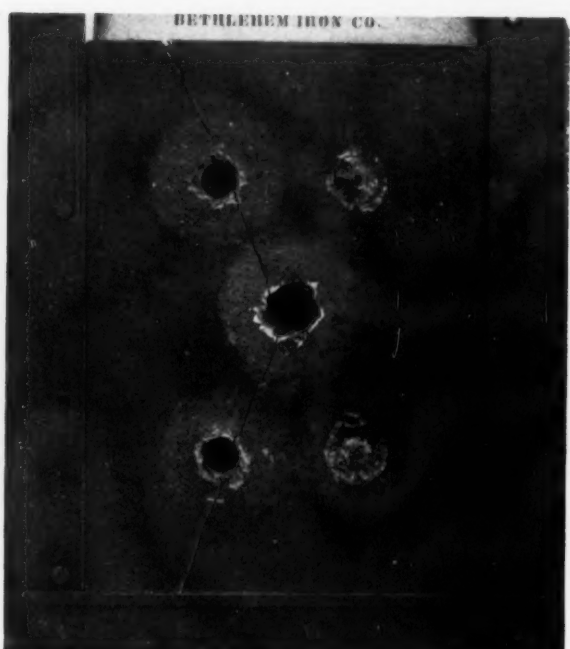


Fig. 12.—Harvey High-Carbon Nickel Steel, Bethlehem.

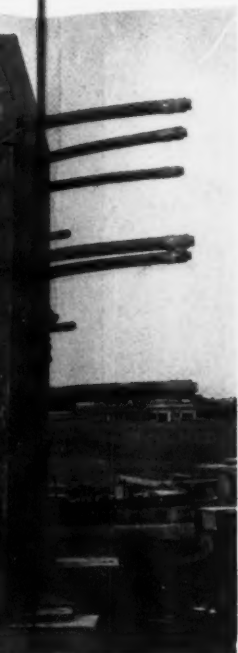


Fig. 13.—Harvey High-Carbon Nickel Steel, Bethlehem.

THE INDIAN HEAD ARMOR TESTS.—TEN AND ONE-HALF INCH NICKEL STEEL
Part thereof Treated by the Harvey Process. Four



Low-Carbon Nickel Steel, Carnegie.



Low-Carbon Steel, Bethlehem.



Carbon Nickel Steel, Bethlehem.

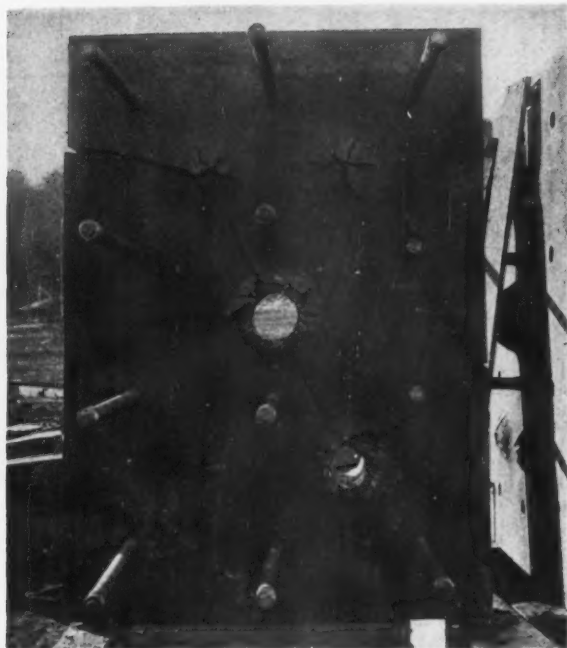


Fig. 6.—Harvey Low-Carbon Steel, Bethlehem (back).



Fig. 7.—Harvey Low-Carbon Steel, Bethlehem (face).



Fig. 9.—High-Carbon Nickel Steel, Bethlehem (back).

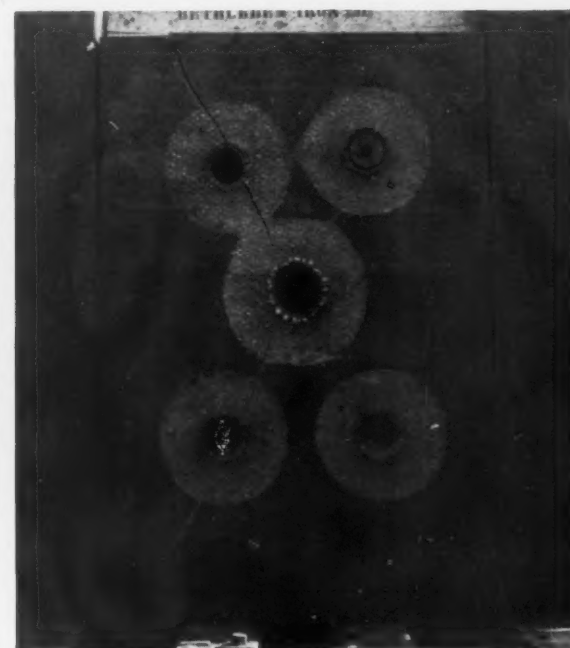


Fig. 10.—High-Carbon Nickel Steel, Bethlehem.

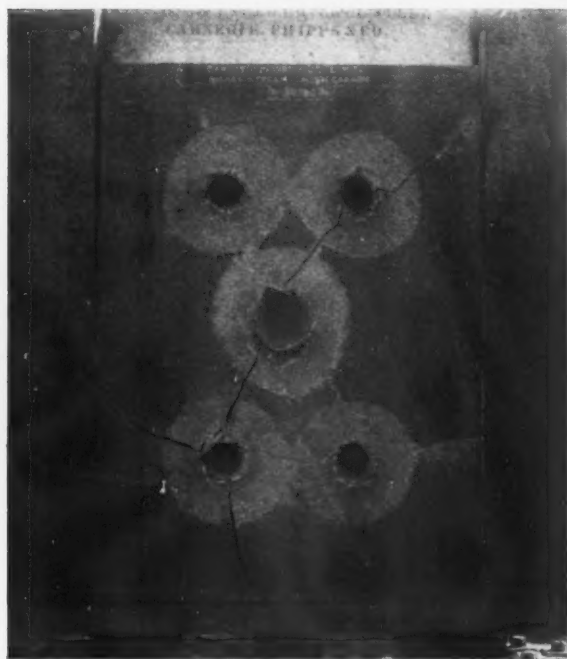


Fig. 14.—High-Carbon Nickel Steel, Carnegie.

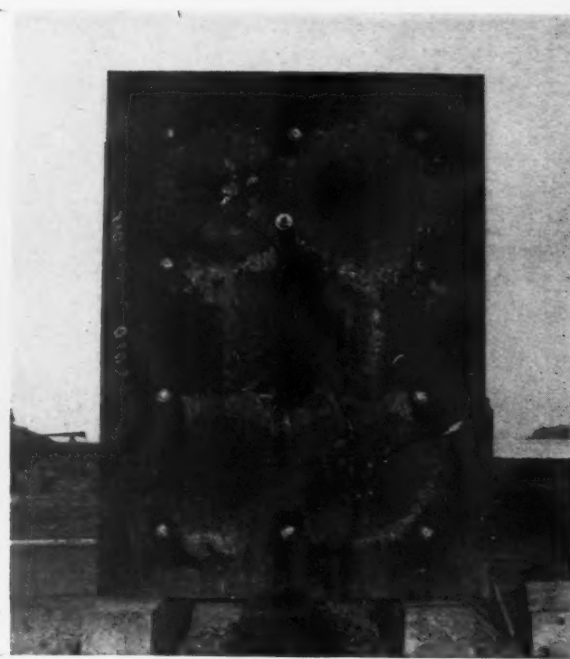
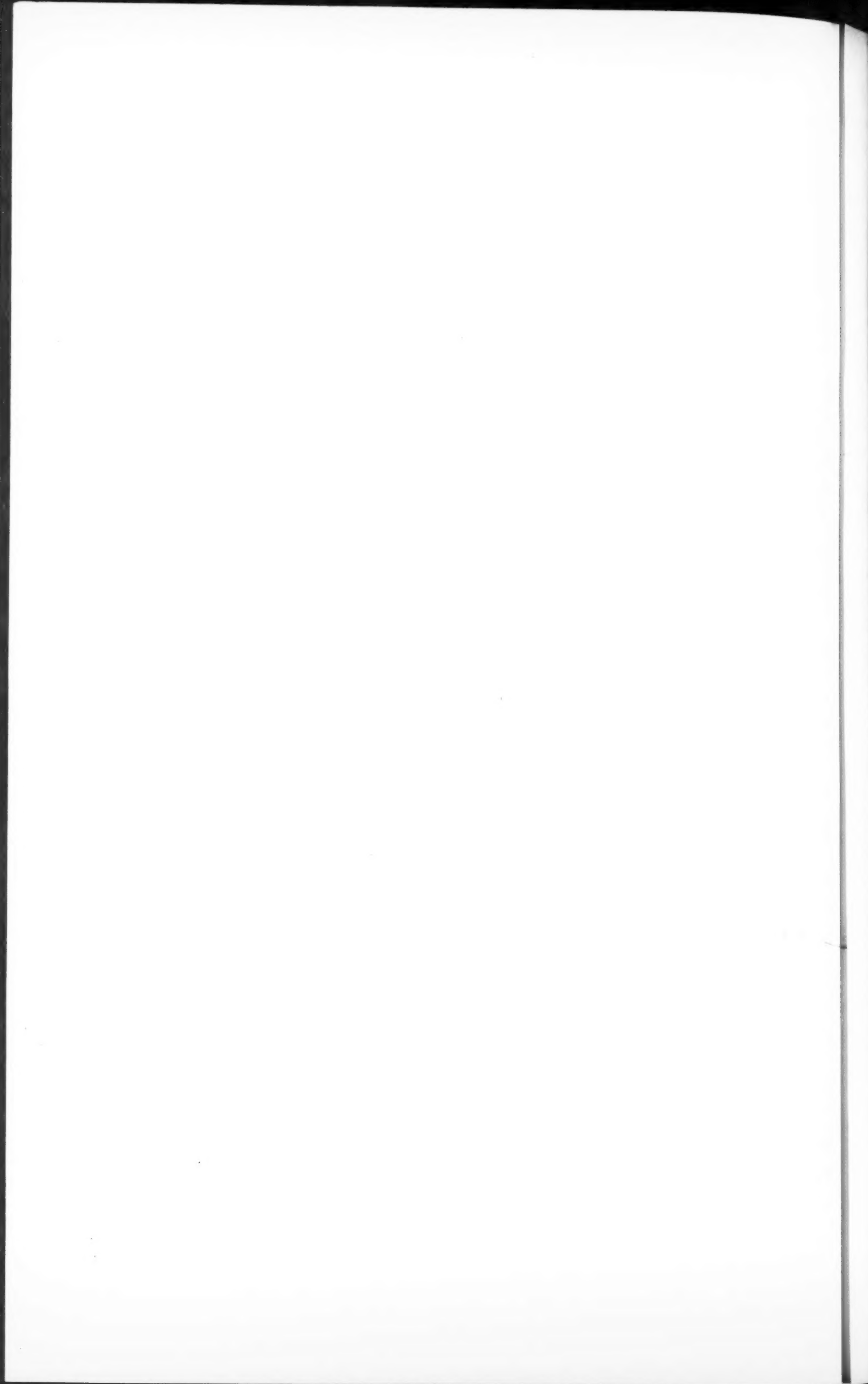


Fig. 15.—High-Carbon Nickel Steel, Carnegie.

STEEL PLATES BY CARNEGIE, PHIPPS & CO. AND BETHLEHEM IRON COMPANY.
Four Rounds 6-inch B. L. R., One Round 8-inch B. L. R.



edly the best armor plate ever subjected to ballistic test.

"It may be assumed that the principle of supercarburizing steel to a considerable depth has passed beyond the experimental stage. The question of tempering or chilling the carburized armor plate needs, however, further experimental development, and the lack of uniformity in results, indicated in the Indian Head armor trials, may probably be ascribed to this want of experience. The assurance of success, however, is so great as to warrant the Department in making further experiment in this direction with every reason for anticipating a completely satisfactory result."

THE WEEK.

It is reported from London that the steamer Massachusetts arrived at Swansea on the 6th inst., where she will take 3000 tons of tin plates for New York.

The dispute over the Bering Sea fisheries may take a new turn. The British Government has negotiated a treaty for the settlement, by arbitration, of the principle which is in dispute, but has evaded the making of any agreement for the preservation of the seal, while the arbitrators are considering the principle involved. That Government has not even consented to the renewal of the *modus vivendi* of last year. One is reminded of the Kentucky justice who sentenced a criminal to the whipping post and told the constable that he might as well carry out the sentence while the justice listened to argument as to his jurisdiction. It is not improbable that the Senate will decline to approve of the treaty until it shall be amended by some provision which will preserve the subject matter while the arbitrators are determining the jurisdiction. If the treaty should be approved without such a clause, or if the treaty should fail of ratification, then our Government would be confronted with the question whether they shall let the seal perish or shall do what Russia would have done, without opposition from Great Britain, if the sale of Alaska to the United States had not been made.

Suit has been begun in Lycoming County, Pa., to set aside the agreement between the Reading and the Lehigh Valley Railroads, and the agreement between the Reading, the Central Railroad of New Jersey and the Port Reading Railroad, so far as the agreement affects the Lehigh and the Susquehanna and its branches. The bill in equity was filed on the 7th instant by Mautios H. Arnot of Elmira, N. Y., alleging that the agreements were prejudicial to his interests and beyond the legal powers of the contracting parties.

The House of Representatives on the 7th inst., by a vote of 189 to 85, set apart March 22, 23 and 24 for the consideration of the Bland Silver bill.

The rumor is current in Boston that the Anchor and the Allan-State lines of steamships are about to consolidate. The State Line's interests were merged with those of the Allan Line about a year ago. The consolidation of the Allan-State and the Anchor lines would create a monopoly of trade between Glasgow and New York and Boston.

The Welch Coal Mining Company are about to open a coal mine near Williamsburg, Ky., on the McCarty spur of the Jellico mountain range. The vein is said to be from 38 to 40 inches thick, and convenient to the railway.

The report of the Commissioner of Railroads of Michigan shows the earnings of the roads in September, 1891, to have been \$8,803,683.92; corresponding month, 1890, \$7,752,763.11; increase for 1891, \$1,050,-

920.81; total earnings, January 1, 1891, to January 1, 1892, \$96,472,329.69; same period in 1891, \$93,075,802.67; increase for 1891, \$3,396,527.02, or 3.65 per cent.

Governor Flower insists that no public franchises shall be granted to private corporations without some corresponding compensation to the cities affected.

Austin Corbin has refused to be president or to remain in the directorship of the New York and New England Railroad.

Twelve hundred petitions, signed by 70,000 persons, have been presented to the Governor of Pennsylvania, asking an early legal determination of the questions involved in the Reading combination.

David Dudley Field, the jurist, proposes Manhattan for the name of the consolidated city. Many years ago he suggested Alleghania as a convenient name for these United States.

Most experts agree that for the painting of war vessels some neutral tint akin to that which the French have chosen for their coast guardships would have to be adopted. The shade referred to is lead color, with a slight tinge of green, similar to atmospheric conditions observed near the horizon during the morning and evening. Ships painted this color are almost indistinguishable after darkness falls. During the Chilean war the torpedo boats Almirante Lynch and Almirante Condell were painted this color. On two occasions, one at Iquique and the other at Coquimbo, both these vessels entered the ports named at night and were scarcely visible a few hundred feet away. Captain Schley is said to favor painting as above stated.

The Secretary of the Treasury, on the 10th inst., reported to the House of Representatives that \$569,089,806 in gold certificates were issued from July 1, 1877, to January 1, 1892, and \$680,708,000 in silver certificates from May 9, 1878. Of gold certificates, \$445,088,561 were redeemed principally in gold coin or bullion, and of silver certificates, \$356,311,682 in new silver certificates. The paper money outstanding July 1, 1886, amounted to \$921,431,194; January 1, 1892, to \$1,097,281,512.

Puts and calls were declared dishonorable by the Board of Trade, Chicago, on the 9th inst., and all dealings in them, directly or indirectly, were forbidden, under the penalties prescribed by the board for dishonorable conduct. The announcement was cheered.

The prospect is that the State tax rate of New York will be much larger this year than last. The Comptroller reports that the receipts from the succession tax will probably fall short of the estimate \$1,926,367.72.

The Naval Committee of the House of Representatives favor the repair of the historical Hartford and Kearsarge. Sentiment is not dead.

The Belgian referendum is creating something of a stir—not that the people object to the Latin—but they fear that they would be accepting a Greek horse, as the Trojans did. It signifies the reference by the King to the people of any question as to which he is in doubt whether he should exercise his prerogative. The local politicians represent the scheme to be a trick.

A Berlin correspondent says of horse flesh for food, that it is the exclusive article, in that city, at eight slaughter houses, twenty-seven markets and two refectories.

A protest of the Independents, against increasing the armaments, was presented in the Lower House of the Hungarian Diet, on the 8th inst., by Herr Eötvös. He said that the respect for the Emperor,

by the other monarchies, pre-eminently fitted him to take the initiative, in bringing to an end the persistent arming.

In the long contest between the special agents of the Treasury Department and the merchants of New York, the latter seem to have won; for the former have been broken up and distributed, and other transfers are deemed probable. The agents are confidential representatives of the Department, and in intentment should co-operate with the customs officials. Formerly they did so; but for some years their action has been independent, if not adverse, as has been charged.

At a meeting of the Associated Chambers of Commerce held at London, England, March 8, the president said that the exports and imports during the past year had only decreased \$23,750,000, but an examination of the details of the returns was not satisfactory, as there was a great decrease in almost every item of the exports, the deficiency being balanced by a large increase in the imports of food. It was not easy, the president added, to determine how far the decrease in the exports was due to hostile tariffs or to the overstocking of foreign markets, but undoubtedly the political and commercial complications in South America and the McKinley Act in the United States were largely accountable for the decrease.

The Massachusetts House, on the 8th inst., by an overwhelming majority passed a bill reading, "No person shall manufacture or sell, or expose for sale, cigarettes with paper wrappers, or cigarette paper in any form."

The expenditures of the city of Boston for last year amounted to \$21,549,375.42, leaving a cash balance of \$3,100,797.79 on hand January 31, 1892, and carried forward to the financial year 1892-3, or \$1,852,522.05 less than on hand May 1, 1891, and this makes an expenditure of \$19,696,863.37 of new money in the nine months ending January 31, 1892.

The report of William Stein, mine inspector of the sixth anthracite district, Pennsylvania, for the year 1891 shows the total production of coal was 6,419,302 tons, an increase of 182,748 tons over 1890.

The House of Commons, on the 7th inst., without a division, registered a motion to complete at once the defenses of Esquimaux on Vancouver Island.

The new Khedive of Egypt has a purpose to re-annex the Sudan, or a portion of it; and the British are likely to favor the scheme as tending to exhaust his resources, and keep him from restiveness under the British occupation of Egypt.

The *Journal of Commerce*, in a long editorial on the 10th inst., strenuously opposes the consolidation of Brooklyn with New York, urging topographical objections, and holding that the Brooklynites would be discontented with such a city government as seems quite tolerable to the Manhattanese.

The holders of the certificates of the Standard Oil Trust are called to meet at the office of the trust on the 21st inst. It is understood that the question of abandoning the trust will be considered, in view of an adverse judicial decision in Ohio and of the popular opposition to trusts. This trust is reported to be formed by individual stockholders in the various corporations and not by those bodies acting in their corporate capacity. It is suggested that the several corporations would continue their operations as if the trust were still in existence.

The Pennsylvania Railroad Company are reported as having nearly completed the purchase of the Lawrence Colliery at Ma-

hanoy Plane, intending to connect it with their line by a branch road. In 1890 the colliery mined 160,000 tons; 399 men were employed. The Reading Railroad seems to have sought to acquire this property.

The question of the validity of the lease of the Lehigh Valley Railroad to the Reading does not cause apprehension. It is thought probable that the general question of the lawfulness of combinations between the Reading and the other roads will be tested in the case of the lease of the Lehigh and Susquehanna, which is parallel to that of the Lehigh Valley.

A bill was introduced into the United States Senate, on the 9th inst., to authorize the President to suspend the operation of the laws and regulations which permit merchandise to be transported in bond across the United States to and from Canada. This would deprive the Canadian Pacific Railroad of a valuable privilege, in retaliation for the Canadian slaughter of female seals.

The annual report of the Massachusetts railroad commissioners presents plans for a union depot at the north end for the Fitchburg, Lowell, Boston and Maine and Eastern railroads, with elevated structure. The demand for facilities of this kind in our large cities will call for a good deal of structural work.

A demand for American corn meal has recently grown up in Germany and other portions of Central Europe, but the native bakers generally are not familiar with the best methods of preparing it for food, although some of them are using it. Mr. Murphy of our Department of Agriculture has been instructing them and now he has been sent to Russia for the same purpose.

Complete returns of the enumeration in Buffalo make the population 278,922, exclusive of the public institutions, which will bring the total up to 283,000.

It is now reported that the Richmond Terminal Company will not include the Georgia Central by consolidation, but through ownership of its stock.

Brick making along the lower Hudson is reported to be in so unsatisfactory a condition that some of the brickmakers continue work only because they have unexpired leases.

A decoction from the leaves of the coffee plant is reported as a new drink.

President McLeod of the Reading Railroad Company, on his examination before the Committee of the New York Senate, declared that the combination would reduce the price of coal, and could do so, because of the elimination of middlemen.

The latest report is that the Austro-Hungarian Government will need £40,000,000 in gold, instead of £20,000,000, as at first estimated, to resume specie payments. This will be raised by a loan, of which the proceeds will be invested in British bills.

It seems that negotiations are in progress for the control, by the American Sugar Refineries Company, of the Franklin Sugar Refinery of Philadelphia, which has a capacity of 10,000 barrels of refined sugar daily, and a plant valued at \$10,000,000. This would leave, as the only independent refineries, that of Claus Spreckels and the E. C. Knight & Co.'s.

On the 9th inst. territorial bonds of Arizona to the amount of \$1,250,000 were sold to a firm in Chicago and \$75,000 were placed in bank as a forfeit.

The production of cotton in Mississippi, according to publications of the Census Office, in the year 1889-90 was on 2,882,-

499 acres, 1,154,406 bales, not including linters; the average yield per acre, four-tenths of a bale, and total value of the crop to the producers, \$51,484,053. The figures reported at the tenth census for the year 1879-80 were as follows: Acreage, 2,106,215; number of bales, 963,111, and yield per acre, 46-100 of a bale.

The Census Office has also issued the preliminary statistics of cotton produced in Louisiana. The acreage in cotton in that State during 1889-90 was 1,270,885; the number of bales produced, 659,583, not including linters, and the average yield per acre, 52-100 of a bale. The figures reported at the tenth census for the year 1879-80 were as follows: Acreage, 864,787; number of bales, 508,569, and yield per acre, 59-100 of a bale. The figures now issued are subject to slight modifications in the final report, which will also include cotton seed and other branches of the cotton investigation which the Census Office is engaged in.

The *Public Ledger* of Philadelphia argues that the British Ministry, in withholding their assent from the sanction of a closed season in the Behring Sea, are preparing a Jingo issue, to help them in the struggle for control of the next House of Commons.

A bill to establish an exclusively United States pilot service, compulsory as to foreign vessels and optional for vessels of the United States, has been reported to the Senate from the Committee on Commerce. The pilots would be appointed and paid through the Federal authorities.

The *Harrisburg Patriot* makes the point that the question upon which the courts should be called to pass is, of the violation of the constitutional prohibition against the merging of parallel roads; that it is immaterial whether the Reading combination would favor or prejudice business interests.

The Richmond County population, according to the State census, is as follows: Northfield, 9769; Castleton, 17,282; Middletown, 11,373; Southfield, 6303; Westfield, 8652; total, 53,379. Total in the Federal census, 53,396.

The *New Orleans Times-Democrat* takes a hopeful view of cotton, quoting with approval the opinion that the cotton of India is too inferior for successful competition with that from America, and the statement that cotton from this country is purchased in Liverpool for use in India, to improve the native product by intermixture with it. The McKinley tariff has driven English spinners to seek a market elsewhere. The American planter gets better prices for the seed, and as an offset to lower prices for cotton, he is able to make purchases of necessities at lower rates.

The New Jersey Legislature on the 11th inst. passed a bill under which it will be possible for the Reading Railroad to legalize their recent absorption of the control of other roads.

The series of lectures of the Young Men's Institute of New York, at their building, 222 and 224 Bowery, continue. Among the speakers at recent gatherings have been Prof. J. E. Denton, on the "Frictional Resistance of Vehicles," Prof. J. B. Webb, on "Mechanical Paradoxes," and Chas. B. Dudley, chemist of the Pennsylvania Railroad, on "Paints." The next lecture under the auspices of the Carriage Builder's National Association will be by Prof. Henry Morton of Stevens Institute, on "Color."

The Cincinnati Corrugating Company of Piqua, Ohio, have discontinued their agency with the Richard Thompson Company of 54 Warren street, New York.

Trade Publications.

A QUARTO CATALOGUE of 222 pages has just been published by the Ingersoll-Sergeant Drill Company of 10 Park place, New York. This book is much more than the ordinary catalogue, since it contains information of great value to those interested in rock drilling, the compression of air and kindred subjects. We first find a brief history of the rock drill, the methods being carefully followed from early records to the present time. Under the subject of drill steels and bits is the statement, "We use the best grade of American steel," followed by descriptions of the blacksmith's tools necessary in forming the several shapes, the advantages of each of which are dwelt upon. There are many good things in the article on "Important Points for Drillers." Electric blasting is clearly explained. The use of compressed air and the compressors of various types are very fully treated.

WE HAVE RECEIVED from Prentice Brothers of Worcester, Mass., a handsomely gotten up catalogue of the drills and lathes built by them. They state that all their tools have been constructed, first of all, for durability and convenience of handling. Stock has been distributed in the most advantageous manner to resist strains incurred in working, while accidental injury of exposed parts has also been guarded against. The materials made use of are those found by a practical experience of many years to be the most suitable, and are throughout of the best quality. All wearing surfaces are ample and fitted in the best manner. In glancing through the catalogue we notice sensitive drills, upright drilling machines of all sizes and patterns, portable drills, gang drills and duplex drilling and tapping machines. A full line of engine lathes is described, as well as the attachments belonging to them.

BENJ. F. KELLEY & SON of 91 Liberty street, New York, have recently issued several pamphlets descriptive of the Berryman Feed-Water Heater and Purifier and the advantages to be derived from its use. The benefits claimed for this make of heater are: 1. That it contains a much greater quantity of water than any other heater, giving ample time for settling so much of the impurities as will separate by heat at a temperature that may be attained in the use of the exhaust steam. 2. The very large amount of heating surface gives a much higher degree of heat in the feed water, and with so large a body of water, and the same being under a pressure constantly maintained by the feed pump, is in a quiescent condition, hence there is ample time for the impurities to separate and settle. 3. The shape of the tube sheets is concave, and a mud or blow-off pipe, placed in the center of the tube sheet, which extends to the water space, will, because of the pressure, carry off all the deposits, and by the same means it will be seen that a surface blow-off pipe is provided to carry off all the lighter substance which rises to the top of the water. The use of the blow-off pipes at the top and bottom, the same requiring not more than a few seconds three or four times in ten hours, keeps the heater clean, scale is prevented and the boiler kept clean. 4. This make of heater will heat to the highest possible degree of heat with the use of the exhaust steam. Without any back pressure a uniform temperature of 240° is guaranteed where the horse-power of boilers and engines is in keeping mechanically the same.

THE Q. AND C. COMPANY, Phenix Building, Chicago, manufacturers of railway supplies, have issued a finely illustrated and beautifully printed pamphlet descriptive of the Servis tie plate. This is a steel plate rolled with flanges. It is intended to be used as a rail fastening, to preserve ties against the cutting in of rail flanges. The flanges of the tie plate are forced into the tie in the direction of the grain, thus acquiring a firm hold in position, and besides resting so snugly on the tie that moisture cannot work under to cause decay. In this pamphlet the special merits of the Servis tie are fully set forth, and in addition very many practical tests are given in detail.

R. B. SPEIDEL, manufacturer of blacklead crucibles, Philadelphia, is sending out a small pamphlet descriptive of the J. K. Griffith stopper and nozzle for open hearth and Bessemer steel ladles. They are in use at Midvale and Bethlehem.

The Iron Age

New York, Thursday, March 17, 1892.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Progress of Steel.

The announcement is made that the National Tube Works Company, the largest makers of tubes and pipe in the country, will put up a two 8-ton Bessemer plant with a daily capacity of about 800 tons, possesses more than ordinary significance. Some time since we called attention in the columns of *The Iron Age* to the progress made in the Wheeling district in the use of mild steel for this purpose, and stated that the signs of the times indicated that the pipe made was to be the next to succumb to the victorious advance of steel. During the past few years soft steel has successfully captured the wire and the nail trade. It has obtained supremacy in plates and sheets. One of the largest makers of railroad spikes in the country adopted steel about a year since. Fish plates are being made of Bessemer steel in increasing quantities and at unprecedentedly low prices. The number of steel car axles in use is growing rapidly. We see mild steel invading the territory of cast iron in car trimmings, in locks, hinges and other small wares. Basic steel is exclusively used for rolled wood screws and has been tried for horseshoe nails. Steel billets may now be found in the stock of the horseshoe manufacturers. Many other instances will occur to those who have watched the development of the trade during the past few years. But no recent change can compare in magnitude with that now impending in the pipe trade, which ranks among the largest of our industries.

The effect of the change from iron to steel is to concentrate the business in the hands of larger concerns. In puddling the unit of plant is the small furnace. In steel work it is the Bessemer converter and the open-hearth furnace. The former particularly will furnish material for a large finishing plant. The larger concerns in a specialty can devote close study to its requirements so far as character of steel is concerned, and will have the advantage of the smaller works which depend for raw material upon the large steel mills, because their supply is under their own control. In dull times steel works will go out of their way to serve small consumers well, with special billets and slabs, in small quantities, but in times of great activity there is danger of neglect.

The iron mills depend upon forge pig and old material for their raw material. The former may be cheapened to some extent, for those who run on that grade only, by an oversupply of ore only

suitable for that one particular purpose. The furnaces that run on foundry iron cannot help making a certain proportion of the lower grades. A large tonnage of it goes into the cupolas of the cast-iron pipe makers, but the balance must look to the puddling mills. When the latter demand is restricted, the price must be lowered until a balance of supply and demand is reached, and in that way some of the puddling mills may be able to keep going.

Old material is widely scattered throughout the country, and when the great primary markets for it no longer take a very large share of the supply, as is already the case, it must drop to the place of feeding local mills protected by long distances from the great centers of production against invasion of finished material. This is the rôle which New England has naturally been condemned to and from which it seems unlikely to liberate itself.

The Copper Agreement.

Although the details of the understanding among the copper mining companies and producers are shrouded in a haze of gossip, there can be no doubt that an agreement has been reached. It is urged that stock operations have had a good deal to do with the undertaking, but on the whole the principal aim has probably been to create in the copper trade some confidence in values. There has been a good deal of boasting and talk lately on the part of the mining companies concerning their plans. Several large producers were understood to be preparing for a largely increased output, and this more than anything else was discouraging to the trade.

Now comes the announcement that the principal mines are to restrict to a certain product. An examination of the figures makes this announcement look rather curious. The Anaconda is put down for 75,000,000 pounds, a figure which it has never approached by 10,000,000 pounds, although its capacity may come somewhere near it. Last year the make was only 46,250,000 pounds. The Calumet and Hecla is credited with a restriction to 60,000,000 pounds, which is only 3,500,000 pounds below its actual maximum, reached last year. The Quincy is allowed 12,000,000 pounds, when its greatest output, reached last year, was 10,542,519 pounds. It is true that the mine is putting up two additional stamps, of which one, however, will not be ready until very late in the year. The Parrot is down for 14,000,000 pounds, which is within 100,000 pounds of the actual production, after deducting the fine copper contents of purchased mattes. The Bigelow-Lewisohn interests include the Tamarack, Osceola and Kearsarge on Lake Superior, and the Boston and Montana and Butte and Boston in Montana. These concerns made in all 69,500,000 pounds in 1891, and are now supposed to be scaled down to 65,000,000 pounds. Here, then, are producers who in 1891 represented 204,000,000 pounds of

the whole product who bind themselves to "restrict" down to 226,000,000 pounds.

The published figures do not include the Arizona interests controlled by Phelps, Dodge & Co., which produced last year about 17,000,000 pounds, and the Old Dominion, controlled by the Keyser interest of Baltimore, with a little over 7,000,000 pounds. We are informed that these parties are members of the "gentlemen's agreement." It is not probable, however, that they will "restrict" by expansion, so that they would bring the maximum allowed by the leading producing interests up to 250,000,000 pounds.

There is one phase of the matter which may prove somewhat troublesome to those who are credited with the difficult undertaking of keeping copper product within bounds, and that is, that in Michigan the law has taken a rather uncomfortable attitude against all pools, trusts and agreements of this character, the penalty being forfeiture of the charter. The only concern which could possibly be prosecuted, if it is true that 60,000,000 pounds is to be its maximum product, is the Calumet and Hecla Company. We are not now discussing the wisdom, from the standpoint of State interests, of such a law. We merely point out that it exists.

We have shown that concerns producing 228,000,000 pounds of copper have undertaken to "restrict" their supply to 250,000,000 pounds annually. But there are a number of outside smaller producers. A certain amount of copper besides comes into the market which has performed simply the function of a carrier for the precious metals in smelting operations. Other amounts are produced from lead ores, a good deal thereof being concentrated into a final matte in lead smelting, refining and desilverizing. Finally, there is marketed in this country quite a considerable quantity of copper derived from Canadian and Venezuelan ores and pyrites, which would remain here, instead of being largely exported. In the aggregate these different quantities of copper foot up to 68,000,000 pounds, out of a total of last year's product and imports of 296,000,000 pounds. There is evidently, therefore, enough copper to go around and leave a good deal for export. In fact, the whole movement looks like an attempt to galvanize life into the foreign markets, and it is understood that negotiations have been under way with the Spanish mines to keep their product within limits. But abroad the controlling of production is even more difficult than here.

So far as manufacturers in the country are concerned it is pretty well understood that the larger ones among them have been pretty well filled up with lake copper for some time to come at 10½ cents. They will regard the advance already established with complacency, if not with considerable favor. If they choose they can go on selling goods at the low prices recently prevailing and take the trade. On the whole, the scare created by the announcement of the agreement to restrict does not seem warranted by the facts. The old syndicate and its disastrous col-

lapse are too well remembered by producers to give them any strong desire for its repetition.

Progress of Smoke Prevention in Chicago.

The campaign against smoke in Chicago is proceeding, with good results. The proper plan of procedure appears to have been struck at last. Heretofore there has been much groping in the dark. Proprietors of smoky chimneys were prosecuted, and many of them honestly endeavored to abate the nuisances by putting in patented devices warranted to secure more perfect combustion, but more failures were scored than successes. The method now being tried by the Citizens' Association is much more sensible, being based on true scientific principles. The old method was to note an offensive chimney, order the proprietor to abate the nuisance within a given time, and follow it up with a suit and a fine in case of non-compliance. It is true that the fine was often remitted or not collected, but that is irrelevant. The point now sought to be made is that every smoke maker was left to solve the problem of avoiding smoke in his own fashion, the municipal smoke inspectors having no authority to recommend any kind of apparatus or devices.

The new method, however, is educational. The officers of the Society for the Prevention of Smoke single out a conspicuous offender against the cleanliness of the community and notify him that they would be pleased to counsel with him as to the means necessary for him to adopt to avoid the production of smoke. If he is agreeable he accepts the offer made, and a thorough investigation is then undertaken of the system of firing employed. The service sought to be obtained from the fuel used is carefully calculated, and the owner is informed of the defective points in his system and how they can best be remedied. It has almost invariably happened that the suggestions of the society's officers have been carried out and that the improvements they recommend have been adopted. In fact, nobody but a very narrow minded or exceedingly close-fisted individual would hesitate to make improvements in his furnaces when the manner in which that can be done and cogent reasons for so doing are placed before him by persons whose motives are wholly above suspicion. Even a close-fisted man, however, is likely to be reached and convinced, as the society shows him that he can save money by avoiding the production of smoke, which means waste of fuel.

The more that is known of the methods now used in Chicago in attacking the smoke nuisance the more does it seem that the root of the evil has been struck. In spite of the numerous inventions for automatic stoking, the ingenious variations in the construction of grate bars, and the improved forms of boilers, the mass of steam users do not yet secure the maximum of efficiency from the fuel they consume. This may happen from various

causes. They may be using too small a boiler for the power they wish to generate, or after installing a boiler for power they may have decided to use it also for steam heating and are thus robbing it of more of its steam than they are aware, or they may have their furnace connected with a defective chimney, or the fire box may be too small or wrongly proportioned to properly consume the fuel thrust into it. An overworked furnace must smoke, and it will probably continue to smoke, even with all the patent smoke preventers harnessed to it that have so far been brought out. This is the defective point now brought under close scientific scrutiny for the first time on such a large scale. It is not too much to expect that if this work can be continued in Chicago for a reasonable period of time, a reformation will be wrought in the matter of the construction of fire boxes. They will be built of dimensions to meet the full requirements of the service expected from them, and the subsequent application of special methods in construction or devices to aid combustion can then be made with reasonable expectation that the smoke trouble will be avoided.

The Southern Consolidation.

When last we alluded to the proposed consolidation of the leading iron and coal companies in the Birmingham district, there was every probability that the fusion of interests would be effected. The most difficult part of the work in negotiations of this character, the valuation at which the properties were to be put in, had been accomplished. The efforts of some of the parties to create a concern with an enormous nominal capital had been foiled, and it was decided to place the concern on the basis of \$20,000,000, 5 per cent. bonds, as compared with a 6 per cent. rate hitherto, and on the basis of \$20,000,000 stock, retaining \$2,400,000 of bonds and \$1,000,000 stock in the treasury. The percentages of the different companies had been agreed upon, and yet the project fell through. As we understand it, Thomas Seddon, the representative of the Sloss Iron and Steel Company, who was in constant touch with the largest holders of his company, insisted upon a liquidation of all the three concerns and the formation of a new company. To this the representatives of the Tennessee Company could not agree, on the ground that a large number of their stockholders were persons who are only temporary holders, with whom a complete change of organization would find no favor. It is intimated that the speculative opportunities of the day weigh more with certain interests in the company than the remote prospects of increased earnings. The results of this divergence of views led to a withdrawal of the Sloss Company, and now the Tennessee and the De Bardeleben have come together, the latter being practically merged in the former.

The consolidated concern does not, of course, occupy the commanding position which the originally planned aggregation

of the three companies would hold. Still, it will even then be a giant corporation, whose product during the last six months of 1891 was about 255,000 gross tons of pig iron, or over 500,000 tons a year. It must be remembered that this is a very large proportion of the total amount of iron which reaches the open market. It is a point not sufficiently appreciated in the trade that at least one-half of the product of pig iron never reaches the open market, so that the influence of single large sellers like the Tennessee Company is really much greater than at first would appear.

While occupying a commanding position, the consolidated company does not, however, hold a controlling power. It is possible that the near future will bring forth a further gravitation of interests to what is now by far the most powerful organization in the Southern trade.

The Bessemer practice of this country has been wonderfully improved of late. Results are now being obtained by the acid Bessemer process which at one time seemed to lie wholly in the province of the basic converter or the open-hearth process. This is being done regularly and not spasmodically, and at quite a number of Bessemer works. For a time the production of a uniform quality of soft steel by the Bessemer process seemed to be the special accomplishment of one large works, but, as usual, the field has broadened, and now quite a number are making it. We have been informed that the billets furnished by one steel works for the purpose of making wire rods have proved to be of such remarkable quality that the rods were drawn to No. 18 wire without annealing. Previously it had been necessary to anneal in drawing to No. 12. The finest quality of black sheets for tin plate are also being made of this grade of Bessemer steel. They are remarkably tough, and take an exceptionally high polish. The analyses of this steel show it to be not only very low in carbon, but also especially low in phosphorus and sulphur. This triumphant achievement in Bessemer practice is, of course, due to a happy combination of circumstances in the whole chain of production—pure ores to start with, coke of the highest quality to smelt them, the best limestone for flux, scientific treatment in the blast furnace, and to crown all, a prince of metallurgists in charge of the Bessemer converter.

During the last few years the officials of some of the leading Eastern railroads have modified their views concerning the character of the steel which will give them the best service in their rails. A strong reaction has set in against the softer steels, which years since were so strenuously advocated, and the tendency is now distinctly in the direction of higher carbons. Sixty and upward is now frequently specified. The natural result has been to change to a considerable degree the character of the demand for spiegeleisen.

At one time there was only one mill which purchased largely of 10 to 12 per cent. foreign spiegeleisen, the others taking principally 20 per cent. Now at least two large works buy the lower grade in considerably increased quantities.

OBITUARY.

JOHN F. WINSLOW.

At Poughkeepsie, N. Y., Thursday morning, March 10, John Flack Winslow, a man whose name was ever connected with manufacturing interests, progress and education passed away. His fame is linked with that of Ericsson and Griswold in the revolution, of naval architecture. He acquired celebrity also as a pioneer in the manufacture in the United States of steel by the Bessemer process.

John F. Winslow was born at Bennington, Vt., November 5, 1810. His education was obtained at the select schools of Albany, N. Y. From 1827 to 1831 he was a clerk in the commercial houses in New York City. In 1831 he became the agent of the New Jersey Iron Company. Two years afterward he became interested in the production of pig iron in Bergen and Sussex counties, N. J. In 1837 Mr. Winslow formed a partnership with the elder Erastus Corning of Albany, which, under different firm names and with various other partners, continued for 30 years. That period covers the history of the development of American iron and steel production. It also covers the history of the period in which Troy, N. Y., changed its character from that of a purely commercial center into a great manufacturing city. The firm controlled the Albany Iron Works, which were located in the southern part of Troy. The plant was widely celebrated from its earliest establishment. In 1807 John Brinkerhoff of Albany built a nail factory at the southern end of the present city of Troy. In 1826 Erastus Corning purchased the establishment for \$5280. Mr. Corning's first partner was John T. Morton, whose place in the business was taken by Mr. Winslow and James Horner, the firm being known as Corning, Horner & Winslow. Afterward Mr. Horner retired and Gilbert C. Davidson and John A. Griswold were at various times members of the firm that owned and managed these celebrated iron works. They extended their production with the development of the country, and were pioneers in introducing new processes.

The public works with which the names of Messrs. Griswold and Winslow are most prominently linked is that of the construction of the Monitor. In 1861 some of the iron for the war ship *Galea* was made by them at Troy. During the month of September in that year Messrs. Griswold and Winslow went to Washington in relation to that work. There they met C. S. Bushnell, who was acting in the interests of John Ericsson, the distinguished engineer.

Mr. Bushnell desired them to examine Ericsson's plans and specifications for a turreted steam battery, and to assist in obtaining from the Government a contract for the construction of one. Examination of the plans satisfied Messrs. Winslow and Griswold, and they entered into an arrangement with Captain Ericsson and Mr. Bushnell to construct a vessel after the former's plans, if the Government would contract for it. With Secretary Seward, Messrs. Griswold, Winslow and Bushnell called upon President Lincoln. He was impressed with Ericsson's design, and subsequently induced the board of naval officers, which previously declined to give any consideration to Ericsson's plan, to report a recommendation for the construction of an experimental vessel.

Without waiting to secure a written contract with the Government Messrs. Griswold and Winslow immediately began preparations for manufacturing the iron plates for the vessel. The contract was duly signed and sealed October 4, 1861. The Monitor was launched at Greenpoint January 30, 1862. Sunday, March 9, of that year, the memorable battle between the Monitor and the Merrimac occurred, justifying the judgment of John F. Winslow and John A. Griswold.

In 1862 these two gentlemen, with Alexander L. Holley, purchased from Henry Bessemer the American rights for the Bessemer process of decarbonizing pig iron to convert it into steel, and they immediately founded a steel works plant at Troy. Thus it fell to the lot of these two men to have a hand in two great revolutions, that of changing entirely the mode of constructing naval vessels and that of cheapening and multiplying the production of steel. The Troy Iron and Steel Company, who succeeded to the ownership of the works with which these famous names are associated, have a capital of \$2,500,000, give employment to 3000 men and pay out annually in wages \$1,500,000. Mr. Winslow was devoted to business, but found some time for public affairs. Proud of the fact that his works had made the iron plating for the Monitor, and that his mill had turned out the first steel rails made in America, he regarded the famous Rensselaer Polytechnic Institute as the apple of his eye. From 1863 to 1867 he was president of its board of trustees, and the Winslow laboratory was named in his honor. About 25 years since Mr. Winslow retired from active business to enjoy his rewards. He built a beautiful residence at Poughkeepsie, and removed to that city. He became one of the foremost citizens there. He was made president of the Poughkeepsie Bridge Company. In 1888 he was chosen Presidential elector on the Republican ticket. He was twice married; In September, 1832, to Nancy B. Jackson of Rockaway, and in September, 1867, to Harriet Wickes of Poughkeepsie. He was an affable, generous and charitable man. He leaves one daughter.

DUDLEY S. STEELE.

Gen. Dudley S. Steele, one of the best-known men in the State of New Jersey, died at his residence in East Orange recently, after an illness covering three weeks. He was born in Jersey City, October 30, 1839, and was the son of Henry Steele, one of the first settlers of that community. General Steele was educated at the private academy in Jersey City of William T. Dickinson. At 20 years of age, in 1859, he was appointed teller of the Hudson County National Bank. After the Civil War he became an employee of the Titan Iron Works, of which his father was the head, and was subsequently admitted as a partner in the firm. On the death of his father he formed a partnership under the style of Steele & Condit, with Nathan W. Condit, Jr., proprietors of the Jersey City Car Wheel Works.

JOHN R. BUCHER.

The Bucher & Gibbs Plow Company, Canton, Ohio, announce the death of their president, John R. Bucher, on February 29. Mr. Bucher was born August 29, 1827, and was thus in the 65th year of his age.

The launch of the new steamer Hartford of the New York and New Haven line was set for the 12th inst. at Neatie & Levy's shipyard. The boat is 240 feet long, 40 feet beam, and will have night accommodations for 200 passengers, besides ample room for freight. The Hartford is a screw propeller, and will be furnished with all the recent improvements in marine engineering.

Pittsburgh Freight Rates.

At a meeting of the Central Traffic Association held in Chicago last week, rates on a number of articles of iron and steel manufacture were reduced from fifth to sixth classes. The reduced rates apply on the following articles: Pig iron, ferromanganese, spiegeleisen, manganese ore, muck bar, billets, blooms, scrap iron and steel, borings, old rails, old car wheels and axles, wire rods, mill cinder and scale, ground iron ore, skelp iron, nail plate, tack plate and tin-plate bars and cast-iron pipe. The rates on the above articles from Pittsburgh to points named below are as follows, and apply in carload lots of 12 tons and over, with the exception of cast-iron pipe, the rate on that applying to net tons: Chicago, Ill., \$2.40; East St. Louis, Ill., \$2.75; Indianapolis, Ind., \$2; Cincinnati, Ohio, \$1.80; Louisville, Ky., \$2.60; Portsmouth, Ohio, \$1.80; Anderson, Ind., \$2; Muncie, Ind., \$2; Terre Haute, Ind., \$2.40; Buffalo, N. Y., \$1.60; Detroit, Mich., \$2; Columbus, Ohio, \$1.70; Evansville, Ind., \$2.75; Zanesville, Ohio, \$1.55; Ironton, Ohio, \$1.80; Milwaukee, Wis., \$2.80; Burlington, Iowa, \$3.55. The above rates will go into effect on Monday, the 28th inst., and will continue in force until September 30 next, unless sooner revoked or superseded.

At the above meeting of the Central Traffic Association, the rates on a number of articles of iron and steel manufacture heretofore taking fourth and fifth classes were reduced to fifth and sixth classes. We give below the rates applying from Pittsburgh and places in Pittsburgh territory to Western points, the first two columns being the rates formerly in force for fourth and fifth classes, while the third and fourth columns show the new rates, on fifth and sixth classes:

	Cents.	Cents.	Cents.	Cents.
Chicago, Ill.	20	17½	17½	15
East St. Louis, Ind.	25	22	22	18½
Indianapolis, Ind.	18	15	15	12
Cincinnati, Ohio.	17	15	15	12
Louisville, Ky.	22	19½	19½	16
Portsmouth, Ohio.	17	15	15	12
Anderson, Ind.	18	15	15	12
Muncie, Ind.	17	15	15	12
Terre Haute, Ind.	20	17½	17½	15
Buffalo, N. Y.	13	10½	10½	9½
Detroit, Mich.	17	15	15	12
Columbus, Ohio.	14	11	11	9
Evansville, Ind.	21	21	21	18
Zanesville, Ohio.	14	11	11	9
Milwaukee, Wis.	23	19½	19½	17
Burlington, Iowa.	32½	27	27	23½

The above rates also go into effect on Monday, March 28, and will continue in force until September 30 next, unless sooner revoked or superseded.

The Southern Emery Wheel Company of Tallapoosa, Ga., is an enterprise created by Charles Heaton, widely known in connection with this special industry. Among the directors are William Howe and W. D. Howe, of the Howe Ventilating Stove Works, while E. C. Bean is treasurer, and Charles Heaton secretary. Stock of the company is being offered for sale.

The United States Patent office, at Washington, announces that in consequence of want of room for the proper storage and arrangement of printed copies of patents, it will be impossible to fill orders in current issues until additional room is provided by the proper authorities. Since the Patent Office is a self sustaining institution, having between \$3,000,000 and \$4,000,000 on the credit side, the public will hardly feel disposed to accept this announcement with the best of grace.

Local United States Inspector of Steam Boilers Brooks, stationed at Albany, N. Y., has resigned. Chief Engineer R. P. Cook of the Albany and Newburg line of steamboats, who has been in service for 24 years, is mentioned as his successor.

The McCullough Iron Company.

A bill has been filed against the McCullough Iron Company of Wilmington, Del., by the Fidelity Insurance, Trust and Safe Deposit Company, trustee, representing 1002 shares of stock, asking for an injunction to restrain the further prosecution by its officers or agents of the business of the company, or in any manner disposing of its property, and for a receiver to wind up its affairs. The company was incorporated in Maryland on February 10, 1865, and subsequently a charter was also obtained in Delaware under the same name, and the two companies united. The capital stock was \$450,000, and it is alleged that on January 1, 1885, the books showed a surplus of assets over all liabilities of \$208,788, but that between that time and January 1 of the present year the apparent surplus of the company has been reduced to \$126,118, and that other losses have occurred since then, rendering the company insolvent. The plaintiff alleges that sheet steel has taken the place to a large extent of sheet iron, and that there is now no demand for the sheet iron manufactured by the company, except at prices below the cost of manufacture, and avers that the losses sustained in seven years' business has been caused in part by gross dereliction of duty on the part of the directors, who refused to make improvements, created new and unnecessary officers, and fraudulently and unlawfully increased the salaries of officers to the extent of \$8100 a year, and, well knowing the capital of the company was impaired, paid out in dividends \$36,000 since January, 1885.

The complainant avers that the true condition of the company is about as follows: Assets, as per balance sheet, \$651,019.25, from which should be deducted amount of false credit from McDaniel & Harvey Company, \$48,408.34; overvaluation of mill property, \$283,662.27; overvaluation of stock, \$26,229.33; true value of assets, \$292,719.41; liabilities, \$568,019.54; excess of liabilities over assets, \$275,300.13.

The mills of the company are as follows: Minquas (Wilmington, Del.), Northeast, Charbon, Charbon Farm (all three at Northeast), West Amwell, Elxton and Octorara, Rowlandsville. These mills, on the company's books, are valued at \$459,162.27; the true value, it is claimed, is \$175,500. The stock on hand, by the books, is placed at \$131,146.13; true value, as claimed, is \$104,916.90. The court, Judge Bond, passed an order requiring the defendant to show cause on or before April 4, 1892, why the receiver, &c., should not be appointed. An injunction was granted in so far as any alteration of the books, &c., was concerned.

According to the *Baltimore American*, the fight is between the McDaniels on the one side and the McCulloughs and the Harveys on the other. They have been fighting for years. A year ago the McCulloughs and the McDaniels joined forces and ousted the Harveys from the management. This year the McCulloughs have thrown their stock with the Harveys, and it is supposed that at the annual meeting next month the McDaniels will be ousted. The application in the bill claims that the company is insolvent. If this is correct it will undoubtedly drag with it the McDaniel & Harvey Company of Philadelphia, whose stock is owned by the same individuals. Nothing as yet has been developed against the latter company.

The officers of the McCullough Iron Company are: President, J. L. McDaniel; vice-president, Enoch McCullough; treasurer, Henry Whiteley; secretary, J. W. McCullough; directors, E. A. Harvey, Geo. W. McCullough, Huxley Harvey, W.

Irving Walker, J. L. McDaniel, Enoch McCullough, Henry Whiteley and J. W. McCullough. The cause of the trouble is that the company has not paid any dividends since the accession of J. L. McDaniel to power.

Officers of the McDaniel & Harvey Company are: President, J. L. McDaniel; vice-president, Enoch McCullough; secretary, D. C. W. McCorkle; treasurer, Henry Whiteley. The company claims to be worth \$150,000.

The Southern Consolidation.

Thomas C. Platt, president of the Tennessee Coal, Iron and Railroad Company, and Henry F. De Bardeleben, president of the De Bardeleben Coal and Iron Company, have made the following statement on the consolidation:

There will be no change in the organization of the Tennessee Coal and Iron Company except increased representation in the Board of Directors, and an increase in the amount of capitalization. The capital of the De Bardeleben Company was \$10,000,000 in stock and \$3,000,000 in bonds. That of the Tennessee Coal and Iron Company was \$5,000,000 in bonds, \$1,000,000 in preferred stock and \$9,000,000 in common stock. That is to say, the two companies represented a capitalization of \$19,000,000 in common stock, \$1,000,000 in preferred stock, and \$8,000,000 of bonded indebtedness. The capital stock of what may be termed, for convenience, the new company, will be \$17,000,000 common stock and \$1,000,000 preferred stock. Of this \$17,000,000, \$1,000,000 will remain in the treasury. It will be seen from this that the joint capital stock has been scaled down, not increased. The importance of this transaction can be better understood by a brief glance at the two properties:

The Tennessee Coal and Iron Company were chartered in 1852 as the Sewanee Mining Company. In 1857 they were changed to the Tennessee Coal and Railroad Company, and continued operating under that name until 1881, when they absorbed the Sewanee Furnace Company. A year later they absorbed the Southern States Iron and Land Company, Limited, and then their name was changed to their present title, the Tennessee Coal, Iron and Railroad Company. Four years later they absorbed the Pratt Coal and Iron Company and the Alice Furnace Company. At present they own 208,000 acres of coal and iron land, chiefly in Alabama, and have ten blast furnaces and 1950 coke ovens. The daily output is 1000 tons of pig iron and 6500 tons of coal.

The De Bardeleben Company represent the consolidation of a half dozen different corporations. They at first absorbed the Bessemer Iron and Steel Company, next the Little Belle, and then the Eureka and the Henry Ellen. All this absorption has taken place within the last four years. This company own 160,000 acres of coal and iron lands in the Warrior and Cahaba coal basins of Alabama. They have seven blast furnaces and 1040 coke ovens. Their daily output is 700 tons of pig iron and 3000 tons of coal.

This company's lands are interlocked and interwoven with those of the Tennessee Coal and Iron Company. In fact, it may be said that the two companies have been rivals in the fullest sense of the word. They mined their coal in practically the same territory, made their iron and coke under similar conditions and with the same advantages, sold their output in the same markets, and the main advantages of a union would be, of course, to minimize the expense and cost of production, and it was, from a strictly business point of view, the logic of the situation.

The two great coal basins of Alabama are the Warrior and Cahaba. They are separated by the Red Mountain, which contains the iron ore from which these companies draw their supply. Over 60 miles of this mountain is now owned by these companies. The Warrior coal field, carrying the cooking coal, is underlaid by the Pratt and Blue Creek seams, the Pratt being about 4½ feet in thickness and the Blue Creek 8 feet minimum. The Cahaba carries the domestic and steam coals. By this union the new companies acquire about 45 miles of the Cahaba and about 50 miles of the Warrior fields.

Pittsburgh and Valley Freights.

A special freight tariff on pig and manufactured iron has been issued by the Pittsburgh and Lake Erie Railway Company, which took effect on the 19th inst. From New Castle, Pa., and Lowellville and Struthers, Ohio, to Cleveland, Akron, Sterling, Ohio, the rates are 55 cents for cinder and scale on carload lots per ton of 2240 pounds; 60 cents per gross ton for pig iron, and 70 cents per gross ton for billets and blooms, scrap iron and steel, old rails, old car wheels, wire rods, iron and steel rails, skelp iron, muck bar, ferromanganese, spiegeleisen, ingots, slabs (unfinished), nail plate, tack plate and tinplate bars. The rates on the last-named articles to Hubbard, Ohio, are as follows: From Pittsburgh, Phillipsburg and intermediate points, 75 cents; pig iron, 69 cents; mill cinder and iron scale, 55 cents; from Homestead, 70 cents; pig iron, 60 cents; mill cinder and iron scale, 60 cents; from Rankin, Braddock, Bessemer, Demmeler and McKeesport, Pa., 90 cents; pig iron, 75 cents, and mill cinder and iron scale 70 cents, all per gross ton in carloads of 12 gross tons or over.

Between Uniontown, Scottdale, Fairchance, Oliphant, Dunbar, Connellsville, Johnstown, Pa., and New Castle, Pa., Lowellville, Struthers and Youngstown, Ohio, the rate is \$1.30 for the manufactured articles, \$1.20 for pig iron and \$1.05 for cinder and scale. Between the first-named points (except Johnstown) and Pittsburgh, Rankin and McKeesport, Pa., the rate is 75 cents, 60 cents and 55 cents respectively. From Youngstown, Struthers and Lowellville, Ohio, to Bellaire, Ohio, and Benwood and Wheeling, W. Va., the rates are 95 cents for the manufactured articles, 75 cents for pig iron and cinder and scale. From Beaver Falls, Pa., to Bellaire, Benwood and Wheeling the figures are 75 cents and 60 cents respectively.

The coal combination has been cited into court by a bill in equity filed at Harrisburg, Pa., on the 15th inst., against the Philadelphia and Reading Railroad Company and their lessors, alleging that they mine more than 60 per cent. of all the anthracite coal produced in this country, and charging that the leases are injurious to the public interest, contrary to public policy, and illegal, and praying for a discovery, the nullifying of the leases, a perpetual injunction and a re-surrender, to the lessor companies, of whatever of their property, within Pennsylvania, may have passed under the control of the Philadelphia and Reading Railroad Company.

John C. Parks of Chicago sailed Saturday on the Fulda from New York for Genoa, Italy. He will travel north from there, partly on business and partly for pleasure, and will be absent for six to eight weeks.

The reversing of the furnace valves of the open-hearth furnaces of the Apollo Iron and Steel Company is recorded by an electric clock.

MANUFACTURING.

Iron and Steel.

Announcement is made that the purchase of the plant of the Iron City Mfg. Company, located in Pittsburgh, has been completed by the Pittsburgh Car Company. The new company are composed of capitalists of Pittsburgh and also of Buffalo, N. Y., and will engage in the manufacture of car wheels exclusively. For the present the works at Pittsburgh will be considered as a branch of the Buffalo Car Wheel Company of Buffalo, N. Y. The new company expect to be turning out car wheels in about 60 days. When this concern is ready for operation it will be the only firm in Pittsburgh manufacturing car wheels.

The Aschman Steel Casting Company of Sharon, Pa., manufacturers of open-hearth steel castings, have recently made some extensive additions and improvements to their plant. A new molding room has been erected 45 x 60 feet in size. The open-hearth furnace has been rebuilt and a 75 horse-power Wheeler boiler has been put in for the use of gas. The machinery equipment has been increased by the addition of new planers, lathes, jaws and drill press, drying ovens, cranes, &c. A new building has also been erected for storing supplies, such as coal, sand, &c. The plant of this firm is now conceded to be one of the best equipped in the country, and their facilities for handling work are excellent. The following are the officers of the Aschman Steel Casting Company: E. A. Wheeler, president; J. J. Spearman, treasurer; and G. A. Baird, secretary.

The chain works of J. Robson & Son, located in Pittsburgh, were destroyed by fire last week. The damage is estimated at \$20,000, partially covered by insurance.

The new Bessemer steel plant of the Ashland Steel Company, at Ashland, Ky., erected by the Pittsburgh Iron and Steel Engineering Company of Pittsburgh, which was put in operation several months since, is running in a very satisfactory manner. About 150 tons of nail slabs are being turned out on single turn, and it is expected that the plant will be put on double turn during the present week.

The new Bessemer plant of the West Superior Iron and Steel Company, West Superior, Wis., built by the Pittsburgh Iron and Steel Engineering Company of Pittsburgh, and which was illustrated in *The Iron Age* of February 4, is now running single turn and turning out about 60 tons of ship plate per day. Arrangements are now being made to put the plant on double turn, which will be done in a short time.

The Norristown Iron works of Jas. Hoover, Norristown, Pa., were closed down on the 9th inst. for an indefinite period. About 250 men were thrown out of employment. The reason advanced for the shut down is the overcrowded condition of the market due to over-production.

The Etna Furnace, at Etna, Ga., owned by Hamilton Brothers, will, it is stated, be soon in operation again.

The Rome (Ga.) Furnace, which was recently shut down for lack of orders, will fire up again in a few days, as it has received some large contracts in the past week or two.

The Newport (Ky.) Rolling Mill Company have started up their sheet mills again. The extensive improvements are about completed, and the company have orders ahead to keep them busy for the next five months.

At the recent annual meeting of the South Pittsburg, Tenn., Pipe Works, it was stated that the affairs of the company were in excellent condition. A dividend of 5 per cent. was declared, making 10 per cent. for the year. The old officers and directors were re-elected, and one additional director, J. R. Rice of South Pittsburg, was elected.

The Gracey-Woodward Furnace, at Clarks-ville, Tenn., is ready to blow in, and the fires will be lighted within ten days. The furnace has a capacity of 150 tons.

The Philadelphia Furnace, at Florence, Ala., has blown in.

The Fort Payne Rolling Mill Company, Fort Payne, Ala., at their recent meeting voted to sell their entire plant to a new organization.

It is stated that the Dora Furnace, at Pulaski, Va., will go into blast about April 1.

Walter Crafts has resigned the receivership of the Anniston, Ala., Pipe Works. The court, on the recommendation of the stock and bond holders, appointed W. W. Stringfellow and W. G. Ledbetter to the vacancy.

All the furnaces in the Birmingham district have reduced the wages of their furnace employees and coke workers 10 per cent. The men generally agreed to the reduction, but

about 100 employees of the Tennessee Coal, Iron and Railway Company quit work. Their places were quickly filled. No change will be made in the wages of the miners.

The Illinois Steel Company will soon be using the new mixer, built for direct metal from the new furnace plant, for the South Chicago mill.

The Board of Directors of the Norristown Steel Company, at Norristown, Pa., have decided to extend the present main building 200 feet in the direction of the Philadelphia and Reading Railroad so as to give more room in the moulding department. The extension will be provided with the same crane facilities as the present building, and an order has already been given to the Morgan Engineering Company of Alliance, Ohio, for a 30-ton electric power traveling crane. The new furnace is nearing completion.

The output of merchant steel during last month at the works of the Windsor Locks Steel Co., in Windsor Locks, Conn., was larger than in any previous February. The company's plant has been extensively overhauled and remodeled during the past few months. Modern furnaces of the Stubblebine pattern have replaced the old reverberatory furnaces, and in addition to the water power, a steam plant consisting of four Wood water-tube boilers a Webster heater, and a Fitchburg engine of more than double the power obtained from the water, has been introduced. In effecting the arrangement of the water power and steam power so that either could be used advantageously throughout the mill, the company employed the services of Remington & Henthorne of Providence, R. I.

It is stated that negotiations have been concluded at Duluth, Minn., for the erection of a structural steel plant to manufacture steel beams, bridge work and angle and I bars of every size. It is agreed that \$350,000 shall be spent in the initial construction of the plant, which shall have a capacity of 200 tons of open-hearth steel per day. James E. York will be the general manager of the new enterprise.

The Grand Rivers, Ky., furnace has shut down for repairs after a short blast. Work on the unfinished stack is being pushed forward as rapidly as possible.

The property of the Powelton Iron Company, consisting of two furnaces, at Saxton, Pa., and real estate, has been sold under foreclosure proceedings to satisfy a mortgage of \$287,000, held by the Guarantee Trust and Safe Deposit Company of Philadelphia. The property was bought in by the bondholders for \$10,000, subject to the above mentioned incumbrance.

The new Philadelphia Furnace of the Florence Cotton and Iron Company, at Florence, Ala., has been put in blast. The stack is 75 x 17 feet, and equipped by three Whitwell stoves, each 70 x 20 feet. The work of erection was commenced in 1887 by the W. B. Wood Furnace Company, and after some delay was completed by the present owners. The product will be foundry pig iron, estimated at 50,000 net tons annually. W. H. Gibbons is president *pro tem.*, James Pollock secretary and treasurer and Daniel King manager.

The new gun-testing department of the Midvale Steel Works, at Nicetown, Pa., has been completed, and work on a new machine shop 250 x 200 feet in size will soon begin. The company have recently secured 32 additional acres of land adjoining the present plant, upon which extensive improvements will be made, enabling the main plant to be connected with the Pennsylvania Railroad.

A charter has been issued to the Rowley & Hermance Company, iron and steel manufacturers, at Williamsport, Pa. The capital is \$325,000.

The repairs to No. 3 blast furnace of the Pennsylvania Steel Company, at Steelton, Pa., are being rapidly pushed, with a view to having the furnace ready for operations by April 1.

A meeting of the creditors of Pierce, Kelly & Co., proprietors of the Duglass furnaces, at Sharpville, Pa., was held in that place on Wednesday, March 9. The firm presented a statement showing their assets and liabilities, and stated that if given sufficient time they would pay 100 cents on the dollar on their indebtedness. Frank Pierce of the firm was appointed trustee to take charge of all the property and handle it for the creditors.

The Laughlin Nail Company of Wheeling, W. Va., whose nail factory is located at Martin's Ferry, Ohio, have closed it down for an indefinite period. The nail factory of this concern is the largest in the country, and contains 245 nail machines, having a capacity of 600,000 kegs of nails.

Work on the plant of the Eagle Rolling Mill Company, at fronton, Ohio, is progressing

rapidly. The housings are nearly all in place, and the rails are being put in and it is expected that the plant will be ready to commence operations about April 1 next.

As we announced last week, the new sheet mill No. 6 of the Etna Iron and Steel Company, at Bridgeport, Ohio, has been put in operation, making a total of six sheet mills now operated by this firm. The daily output of the Etna Iron and Steel Company now consists of about 0 tons of light and heavy sheets and 95 tons of bar iron, or a total output of 165 tons. The range of output is very considerable, the bulk of it being in sheets from 1/4-inch gauge up to No. 30, round bars from 3-16 inch thick up to 4 inches, and in flat bars from 1/2 inch to 7 inches. They also make a large variety of sheets and odd sizes. Every department of the plant is now in full operation.

Machinery.

The Westinghouse Electric and Mfg. Company of Pittsburgh have closed a contract with a Western syndicate to furnish 200 motors for street railways. It is stated that the contract amounts to \$218,000, and is one of the largest that the concern have secured for some time. It is understood that the motors will be used on electric street railways to be built in Lincoln, Neb.; Fort Wayne and Evansville, Ind.

It is stated that Pittsburgh capitalists are negotiating for the purchase of a site of land at McKeesport, Pa., adjoining the plant of the National Tube Works Company, on which they propose to build a foundry and machine plant. The names of those interested have not been made public, but it is stated that if the land is secured the machine shop and foundry will be removed from Pittsburgh and erected on the ground.

At Buffalo, N. Y., March 10, the property of the Buffalo Railway Supply Company was sold by Receiver Armstrong. Six acres of land and the new shop were sold, all for \$26,776. The building alone cost the company nearly that amount. The machinery and the six months' lease of the old shop, corner of Smith and Elizabeth streets, were sold to R. R. Ditzel for \$5100. The franchises of the company went to Frank Peren for \$6. The office furniture brought \$156.75. The result of the sale will pay all the company's debts. R. R. Ditzel is now operating the Smith street shop, and Frank Peren will eventually run that on Bailey avenue. He may build iron steamboats.

W. W. Nugent has been appointed the sole agent for the Goubert water-tube feed-water heaters in Chicago, his office being located at 82 1/2 Home Insurance Building, that city.

The Grant Locomotive Works of Chicago are rapidly hastening toward completion. The machinery is being tested, the engines and electric-light plant having been in place for some time.

The Van Duzen Gas Engine Company, Cincinnati, Ohio, are furnishing the Patton Motor Company, Chicago, Ill., with their gasoline engines, to be used in the company's motor cars for street service to supply the necessary power for generating the electricity required for the storage batteries used in the Patton system, the latest engine being one of 30 horse-power capacity, the use of these engines in this connection furnishing a cheap method for obtaining power, the estimated expense of operating one of these motor cars, based upon actual experience, being but 17 to 20 cents per hour.

The Horner Machine Company, Holyoke Mass., manufacturers of emery grinding and special machinery, have removed to a building on Bigelow street. The new factory is 110 x 33, and contains four floors, which will be devoted to the business of this concern.

Holyoke Hydrant and Iron Works, Holyoke, Mass., are sending out pamphlets illustrating the Bay State elevator, a spur-gear elevator, which they claim is safer than a worm-gear machine, and much more economical in the use of power. This machine is particularly adapted for use with electric motors. The printed matter also describes the Holyoke fire hydrant, which is well known throughout the country.

At a recent meeting of the stockholders of the Brunswick Foundry, Machine and Mfg. Company, at Brunswick, Ga., it was decided to increase their capital stock for the purpose of building a marine railroad sufficiently large to accommodate vessels of 200 tons.

The Trask Milling Machine Company of Boston, Mass., have an entire new departure in the making of milling cutters by a milling process in gangs instead of turning one at a time, thus insuring absolutely perfect shape. Any standard cutter can be duplicated.

The new Board of Directors of the Union Switch and Signal Company, elected at the meeting held in Pittsburgh last week, have or-

ganized by the election of the following officers: Geo. Westinghouse, Jr., president; E. H. Goodman, general manager, and an Executive Committee consisting of A. M. Byers, Thos. Rodd and Jas. H. Willock.

The Allentown Foundry and Machine Company of Allentown, Pa., are about to enlarge their equipment by the erection of a brick addition 30 x 170 feet.

The foundry of A. J. Sweeney & Sons, which was to have been removed from Wheeling to Staunton, Va., will finally locate at Harvey, Ill. The Staunton Development Company were financially embarrassed, it is said, and unable to carry out their part of the contract, after work on the building had begun.

The Trimont Mfg. Company of Boston will locate their wrench factory at Oswego, N. Y., an inducement having been offered.

Cleveland, Ohio, parties have incorporated the Hart Mfg. Company, capitalized at \$50,000, for the manufacture of tools and dies.

A company with a capital of \$25,000 has been organized to manufacture drawn steel and keys for machinery, at New Brighton, Pa.

Naylor Bros.' Foundry, at Peekskill, N. Y., has been burned, at a loss of \$10,000; insured.

The Central Iron Works of Harrisburg, Pa., are erecting a new building 300 x 75 feet, of iron, in which boiler plate will be made.

In connection with its foundry at South Lawrence, Mass., the Emerson Mfg. Company will build a machine shop 275 x 50 feet, with an L 100 feet long for wood work. The enlargement, which is made necessary by increasing business, will increase the capacity of the company 50 per cent.

A boiler shop, 189 x 28 feet, has been added to the works of Hetherington & Berner, Indianapolis, Ind.

Henry C. Pease & Co. of Worcester, Mass., who failed a short time since, have filed a voluntary petition in insolvency, and offer 25 cents on the dollar in settlement of all debts.

The Athens Foundry and Machine Company have been incorporated at Athens, Ohio, with a capital stock of \$50,000.

Hardware.

Huron Grindstone Company, Port Austin, Mich., advise us that they have recently purchased 4 miles of railroad running from their quarry at Grindstone City and connecting with the Flint and Pere Marquette Railway at Port Austin. The Flint and Pere Marquette Railway Company are to lease the road and put it in operation at once to handle the company's business. The company allude to this as giving them an advantage over other manufacturers of Lake Huron grindstones, stating that there is no railroad extending to Grindstone City, and that all of the Lake Huron grindstones have heretofore been shipped by water to some distributing point. The Huron Grindstone Company can now ship grindstones and scythe stones all rail direct from their factory to customers, and thus save the expense of a yard. The railroad thus bought was built by the Port Austin Mfg. Company in 1886, and was operated by them two years. The company then failed and nothing has been done with it since.

The F. & N. Mfg. Company, Richmond, Ind., have received from the Geo. Hayden Hardware Company, Jacksonville, Ill., a printed list containing the names of 153 persons residing in that city to whom were sold that number of F. & N. Lawn Mowers during the season of 1891, the actual number sold by the firm mentioned being 168. In view of the fact that it was the first year the firm handled the F. & N., it is considered as conclusive evidence of the merits of the machine in question.

The Joliet Wheel Company of Joliet, Ill., are now engaged in the exclusive manufacture of bicycles. They have a well-appointed machine shop in which they not only fit the various parts, but are also prepared to make many of the essentials in the case of any hitch in the receipt of supplies. The company also do their own nickel plating and japanning. Their entire product for this year will be marketed by Thorsen & Cassidy of Chicago. The principal owners of the company are Andrew S. Phelps and his son Fred W. Mr. Phelps, Sr., is well known in the Western hardware trade through his long connection with the Detroit Stove Works.

The American Wringer Company, 99 Chambers street, New York, have purchased land and will enlarge their plant at Woonsocket, R. I., which was formerly that of the Bailey Wringer Company. The proposed buildings will be a main factory, 150 x 60 feet, three stories, of brick; a storehouse, 100 x 60, also three stories and of brick, together with the necessary boiler and engine houses. It is designed to be a model manufacturing plant. The concentration of the work is for the purpose of saving transportation of the finished

parts from one part of the country to another, which has hitherto been necessary to the finishing of every machine. The new buildings will be used for the manufacturing of their own wringer rolls, and they also intend to increase their wringer plant at that point, although they are now turning out from their Woonsocket works 1500 wringers per day, while at their four plants they are turning out 2500 wringers per day.

Miscellaneous.

The Board of Directors of the Philadelphia Natural Gas Company of Pittsburgh have declared a dividend of 1 per cent. to the stockholders of record on April 1.

At the annual meeting of the stockholders of the West Moreland and Cambria Natural Gas Company held in Pittsburgh last week the following directors were elected: H. Darlington, J. M. Guffey, A. M. Mellon, Joshua Rhodes, Cyrus Elder, Jas. McMillen. The directors organized by electing H. Darlington president, J. M. Guffey vice president, A. W. Mellon treasurer and R. Mackenzie secretary.

Sing Sing, N. Y., will soon lose two of its industries. The Arcade File Works are about to remove to Atchison, Kan. They employ 250 men. The Monitor Iron Works are also desirous of locating elsewhere.

The Trenton Iron Company of Trenton, N. J., report that in addition to the line which they have just so successfully built for the Holy Moses Mine in the new Creede district, they have received the following contracts: One line for the Amethyst Mining Company in the Creede camp, having a length of 8250 feet and a capacity of 200 tons per day; another line of 5150 feet for the Smuggler Union Mining Company in Ouray, Col., with a capacity of 200 tons per day, and another line for one of the Haggins mines in Guanacevi, Mexico, having a capacity of 100 tons per day and a length of 5960 feet. They are also under contract for one of their large cable hoists for the Avondale Stone Company of Pennsylvania, and have just completed a duplicate one for the Pasaic Quarry Company of Paterson. They are also about duplicating the big cable transfer over the Susquehanna at Williamsport. In addition to these they are now constructing an 800 ton per day tramway for the Pennsylvania and West Virginia Coal Company in West Virginia, and another one for the transportation of culm for the St. Bernard Coal Company of Kentucky; also a large haulage plant for the Croton Falls Magnetic Iron Ore Company, near Brewsters, N. Y.

The Pruyn Potato-Digger Company, Eagle Bridge, N. Y., are endeavoring to raise their stock from \$50,000 to \$100,000. The season's production was 462 diggers.

The Gilbert Car Mfg. Company, Green Island, N. Y., have a contract to furnish the Troy, N. Y., City Railway Company with 12 new electric cars. It is expected they will be completed by May 1.

The Elmira, N. Y., Bridge Company sent three large spans to the State of Tennessee last week. They are to be used on the middle span of the Gravesville Bridge, over which the A. and St. L. Railroad will run.

Eugene H. Benson, manufacturer of trucks for use in manufactories, of Jamestown, N. Y., has made a general assignment to J. W. Willard.

The chain works of Robson & Sons, Soho, Pa., have been destroyed by fire at a loss of \$15,000.

The works of the Colwell & Collins Norway Bolt Company, at Cleveland, Ohio, have been destroyed by fire. The loss is placed at \$100,000.

Ball Brothers' stamping works, at Muncie, Ind., which were burned last fall, have been rebuilt on a larger scale, and are now running to their full capacity. Their main building is 410 x 40 feet, two stories high.

Geo. S. Hale, of Oconto, Wis., manufacturer of barb-wire spools, has failed, with liabilities of \$20,000.

The Structural Iron Works, at New Albany, Ind., have resumed operations after a two weeks' shut down on account of labor difficulties.

The strike of the wire drawers at the works of Washburn & Moen, Worcester, Mass., has been settled and the men have returned to work.

Among recently licensed corporations in Illinois are the following: Chicago Tin Plate Company, Chicago; capital stock, \$250,000; incorporators, Frank O. Felton, Malcolm Dale Owen and Douglas C. Gregg. Monterey Wire Nail Company, East St. Louis; capital stock, \$300,000; incorporators, Robert C. Pate, Edward B. Roth and Frederick C. Bengdorfer. The National Key Opening Can Company, Chicago; capital stock, \$100,000; incorporators, John Zimmermann, J. K. Underdown and

F. L. Collins. The G. L. McGregor Steel Boiler Bracé Company, Chicago; capital stock, \$50,000; incorporators, George L. McGregor, A. L. Wright and W. A. Roole. The Taylor Cycle Company, Chicago; capital stock, \$50,000; incorporators, Arthur A. Taylor, Walpole Wood and William L. Chitty. Seymour Concentrator Company, Chicago; to manufacture and operate mining machinery; capital stock, \$5,000,000; incorporators, Charles F. Staver, James H. Staver and David H. Sunderland. Self-Feeding Thresher Company, Freeport, Stephenson County; to manufacture threshing machines capital stock, \$100,000; incorporators, August Bergman, Daniel C. Stover and Frederick Dorman. The Iowa Barb Steel Wire Company, Chicago; capital stock, \$50,000; incorporators, R. E. Sears, A. L. Gettys and W. E. Newhern. The Lamont Iron Company, Chicago; capital stock, \$40,000; incorporators, Adams A. Goodrich, Frank H. McCulloch and Albert M. Cross. The Carmi Flow Works, Carmi; capital stock, \$22,600; incorporators, A. K. Boyer, Lev Jones and others. Hynes Buggy Company, Quincy; capital stock, \$15,000; incorporators, Patrick B. Hynes, H. F. J. Ricker, Jr., H. R. Hynes. The Standard Foundry Company of Belleville, Ill.; capital stock, \$30,000; incorporators, Robert Rogers, Sr.; Charles Rogers and Laura Rogers.

T. D. Ledyard of Toronto, Ontario, has issued a circular descriptive of the Bessemer ore property at Snowdon, Haliburton County, Ontario. It contains reports by C. Gordon Richardson and Charles Simmons of Toronto. The property is located 220 miles from Buffalo.

Executive Commissioner W. M. Bickford of Montana, who has been active in the development of the mining exhibit for the World's Fair from that State, says it will be something remarkably fine.

H. B. Crowl, analytical chemist, has opened a laboratory in the Chamber of Commerce Building, Duluth, in Rooms 631 and 632, with Charles F. Howe, the well-known mining engineer.

W. W. Lindsay, Western manager of the Philadelphia Engineering Works, Limited, has opened an office on the seventh floor of the Phenix Building, Chicago. These works are now making a specialty of Corliss engines, but are also widely known as builders of blast furnaces.

It is reported from Minneapolis that the Cordage Trust controls the market by controlling the manufacturer of the improved binding twine machines, so that concerns are obliged to use old and inferior machines, which have an output so small as not to affect the market in Minnesota.

The French Navy is to have a number of vessels added before 1895, and on their completion the navy will consist of 27 battle ships, 29 cruisers, 12 torpedo dispatch boats—"happy dispatch" boats—and a variety of less formidable though useful fighting craft.

Michigan has 52 woolen establishments, and their capital is \$1,890,000, against \$700,000 by the last census. The value of the land, buildings and machinery devoted to the wool industry in Michigan is \$1,017,000. There are employed 1428 persons in this business in the State.

A number of coal companies operating mines in southern Colorado are considering a plan to unite their interests under one management, with headquarters in Pueblo. This is independent of the combination forming in New York, under the lead of the Colorado Fuel Company and Colorado Coal and Iron Company.

TRADE REPORT.

The most conspicuous feature of the transactions during the past week has been the further development of a tendency to sell crude material for delivery during the whole of the year at low prices. It is a confession on the part of some makers, and notably of the largest of them, that they do not hope for any improvement for 1892. Many leading authorities in the Iron trade do not go quite so far, but there are few who have the courage to predict any improvement before midsummer.

Reports from the Mahoning and Shenango valleys are growing a little more definite as to the blowing out of furnaces, and from the Lehigh and Schuylkill valleys comes a similar story. But the aggregate capacity thus involved is not yet great, and is at least partially offset by the blowing in of their new Southern furnaces, Florence, Clarksville and Dora being named. Philadelphia reports a sale of 12,000 tons of Alabama Foundry Irons, at a low figure, for delivery during the whole of 1892, and Cincinnati records a sale of 8000 tons, the details of the transaction being shrouded in a veil of suspicious secrecy. In Chicago \$9, Birmingham, has been declined for a 10,000-ton block, which would indicate that all Southern sellers are not willing to go to the lengths of some of the companies. The fusion of the three Birmingham companies has fallen through, and the outcome of the negotiations is that the De Bardeleben Company are absorbed by the Tennessee Company. From different markets come reports of moderate activity in Charcoal Iron. Bessemer in Pittsburgh has settled down to \$14.50.

Pittsburgh reports two large transactions in Billets, one lot of 10,000 tons sold by a Wheeling mill for delivery during the balance of the year, at \$23.25, and a further sale of 9000 tons, delivery up to June, at \$22.75. In the other markets little has been done.

Rails have been more active. Western mills have taken the greater part of 15,000 tons for the Baltimore and Ohio, 20,000 tons for the Southern Pacific and upward of 15,000 tons for the Pacific Coast. Some interest is shown in the results of bids on a small order for Lake Superior. The New York report gives the details of an interesting transaction in foreign Rails, which shows that the English market is getting perilously near the lowest figures on record there.

In manufactured Iron and Steel there has been little that is new. Chicago notes a little more activity in Bars and Plates, and Philadelphia reports a large transaction in Sheets, but on the whole there is little evidence of improving markets. On the contrary, facts crop up at times which indicate that values are still receding under exceptional circumstances.

We may note a sale in Philadelphia re-

cently of foreign Bessemer Ore as low as 67¢ per unit.

Copper is having a little boomlet of its own, on the strength of the understanding among the producers, to which we refer editorially. Mines which last year produced 228,000,000 lb are going to restrict their 1892 product to 250,000,000 lb. The other metals are dull.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, {
PITTSBURGH, March 15, 1892. }

The week under review has been a quiet one, with the advantages decidedly in favor of buyers. Prices in some lines, especially Bessemer Pig, are weaker, and the situation as a whole is worse than at any time this year. As the weeks go by without bringing an upward turn, the feeling grows stronger that the year 1892 will be one in which manufacturers will do well if they can come out without a loss. In an interview with Andrew Carnegie, printed in *The Iron Age* last year, that gentleman stated, that Iron and Steel manufacturers who closed their books for 1891 without a loss would not have any reason to complain. As prices now are considerably lower than at any time during 1891, it would seem that those who can do this for 1892 will be doubly fortunate. Of course the year is young yet, and a change for the better may come, but present indications do not point that way.

Pig Iron.—The remarks made under this heading last week could be reprinted and would cover the situation very well. While the transactions were possibly a little larger than the previous week, prices are a shade lower. A little relief has been extended to the furnacemen in this section by the railroads in the shape of a reduction of 10¢ per ton on freight rates. Pig Iron and a number of other articles, such as Muck Bar and Spiegel, can now be brought from the Mahoning and Shenango Valleys, and points taking the above rates, into Pittsburgh, for 60¢ per ton, the former rate being 70¢. The reduction went into effect on Monday, the 14th inst., and applies from Pittsburgh to the above points as well. We have advised that a reduction on Coke rates from the Connellsville region to the valleys is also contemplated by the railroads, and will be made at an early date. Reductions on carrying rates for Limestone and Ore are also being considered, and will probably be made within a short time. The shut-down movement among the furnaces has not as yet occurred to any great extent. Among those that will go out this month is Mabel Perkins & Co., Limited, at Sharpsville, Pa., and the stock of the Raney & Berger Iron Company, at New Castle, Pa. Pierce, Kelly & Co., at Sharpsville, Pa., have made an agreement with their creditors, but their Douglass Furnace is still banked. The present condition of the Pig Iron market has been sized up by a Mahoning Valley furnaceman, who likens it to the boy with the corn cakes. He could not eat them all at once, "but give him time." He believes that the present large stocks will be worked off in due time and a better situation of affairs will then result. Prices remain about as given last week, with the exception of Bessemer, a number of sales having been made at \$14.50 for close delivery. We quote as follows:

Neutral Gray Forge.....	\$12.75 @ \$13.00, cash
White and Mottled.....	12.50 @ 13.00, "
All-Ore Mill.....	13.75 @ 14.25, "
No. 1 Foundry.....	14.85 @ 15.00, "
No. 2 Foundry.....	14.10 @ 14.25, "
No. 3 Foundry.....	13.75 @ 14.00, "
Bessemer Iron.....	14.50 @ 14.75, "
Warm-Blast Charcoal.....	18.50 @ 20.00, "
Cold-Blast Charcoal.....	25.00 @ 27.00, "

The open market for Bessemer Iron is \$14.75. We note a sale by a valley furnace of 3000 tons of Bessemer at \$14.50, delivered, the freight being 60¢ and deliveries running into June. Also a sale of 5000 tons by a city furnace at \$14.50, the freight being 20¢, with deliveries the same. Other smaller sales have been made up to \$14.75, the deliveries and terms fixing the prices.

Ferromanganese—Continues as reported last week, \$62.50 @ \$63. The demand is light, and the few orders going are taken generally at first-named figures.

Steel Billets.—The event of the week was a sale of 10,000 tons at \$23.25 at mill, made by Wheeling. The deliveries are 1000 tons per month and run until January, 1893. This is the first sale of which we have advices with deliveries running into next year, and it will undoubtedly have the effect of keeping prices from advancing any for some time at least. If the Nail factories in and about Wheeling were employed to any extent there would not be much Wheeling Steel find its way into the market. As but two factories in the Wheeling district are running, that section is putting a large amount of Steel into the market just now, and at bottom prices. Pittsburgh mills are pretty well sold up, and it is said that one concern is sold up to July 1, and have not an order on their books at less than \$23.50. Billets are held here firmly at \$23, which can be considered the market price.

Steel Plates.—The market is unsatisfactory and complaint is made that orders are hard to secure and represent but little tonnage. We repeat quotations of last week, as follows: Fire Box, 3.75¢ @ 4.15¢; Flange 2.25¢ @ 2.30¢; Shell, 2.15¢; Tank, 1.90¢ @ 1.95¢.

Structural Material.—There is nothing of interest to report. Business continues fairly good and though the orders are for small lots, buyers are hard to satisfy and insist that their business be taken at prices which manufacturers say leave little or no profit. Considerable business is in sight, but materializes very slowly. We quote as follows: Beams and Channels on a basis of 2.25¢ for desirable orders and 2.35¢ for small lots. Angles, 1.90¢ @ 1.95¢; Universal Mill Plates, 1.90¢ @ 2¢; Tees, 2.50¢; Refined Iron Bars, 1.75¢; Steel Bars, 1.75¢.

Wire Rods.—Transactions continue small, and we are not advised of any large orders having been placed for some time. We continue to quote at \$22.75 at mill, and, as stated last week, a desirable order would be taken at less than the above quotation.

Barb Wire.—The active demand noted last week continues, and prices are maintained without difficulty. Manufacturers insist that a further advance in prices will soon come if the present large business continues. We quote as follows: \$2.25 @ \$2.35 for Painted, and \$2.70 @ \$2.80 for Galvanized, f.o.b. at factory, the lower prices named being for carload lots.

Muck Bar.—The demand seems to be growing less, and it is extremely difficult to make sales even when rock bottom prices are offered by the seller and favorable terms. Several deals were on last week which involved large amounts, but as yet only one has gone through. During last week a number of puddling furnaces in Pittsburgh mills were closed indefinitely, and the men were advised to seek other positions. Large stocks are reported, and the outlook is not bright by any means. We continue to quote at \$24.75 @ \$25 in the absence of business.

Steel Rails.—Since our report of last week we are advised of considerable business being placed. The Baltimore and

Ohio are said to have placed orders recently for about 15,000 tons, equally divided between Cambria, Edgar Thomson and Steelton. The Southern Pacific is also credited for 20,000 tons, but the names of the mills who will share in it have not been made public. We continue to quote at \$30, f.o.b. at mill.

Wrought-Iron Pipe.—It is evident that the time is coming when Pittsburgh will be in the market with steel tubing. The National Tube Works Company of McKeesport, the largest Pipe and Tube manufacturers in the world, are now figuring on the erection of a Bessemer Steel plant, and may let the contract in a short time. Two constructing concerns in Pittsburgh are said to be bidding on the work. A new blast furnace for making Bessemer Pig is also among the possibilities by the same concern. If built, it will be placed beside the two Monongahela stacks. There is no improvement to be noted in the demand, and business continues to be done at low figures. Discounts are unchanged, but they are entirely disregarded by the makers.

Manufactured Iron.—There is nothing new to report. Demand is only moderate and orders received are not sufficient to keep the mills running to anything like full capacity. As things look now, an effort will undoubtedly be made this summer to reduce wages of skilled labor. Manufacturers here state that they cannot afford to pay \$5.50 for boiling against \$3.25, the price paid in a number of Eastern mills. The first movement looking to a general reduction has already been made by one concern, and it will undoubtedly be followed by others, particularly concerns employing non union men. We have quite a number of those here now, and their number is certain to be increased this year. We repeat our quotations of last week, as follows: No. 1 Bars at 1.62½¢ @ 1.65¢, 60 days, 2 % off for cash. Bars from Old Rails at 1.50¢ @ 1.55¢. Plate and Tank Iron is dull and we quote at 1.75¢ @ 1.85¢; No. 24 Sheet at 2.50¢ @ 2.6¢, 60 days, or 2 % off for cash. Skelp Iron is ruling at 1.60¢ for Grooved and 1.80¢ for Sheared, four months, 2 % off for cash.

Nails.—The demand for Cut Nails is very small, and they take a very obscure place in the market. But two concerns in the Wheeling district are running, and these only about half time. We quote at \$1.50 in carload lots for 30¢ averages in the Wheeling district. Business in Wire Nails is brisk, and the mills are all pretty fully employed. We quote at \$1.70 in carload lots, and \$1.75 in smaller quantities.

Scrap Iron.—Trade is exceedingly dull and the few sales being made are for small lots only. We have not been advised of a sale of Scrap involving any considerable amount for some time. We quote as follows: No. 1 Railroad Wrought Scrap, \$18 @ \$18.25 ¢ net ton; Cast Scrap, \$12.50 @ \$13 ¢ gross ton; Steel Rail and Bloom Ends, \$17.50 @ \$18; Cast-Iron Borings, \$10 ¢ gross ton; Machine Shop Turnings, \$12 ¢ net ton; Mixed Country Steel, \$14 @ \$14.25 ¢ net ton.

Old Rails.—Nothing is doing and prices remain unchanged. We quote Old Steel Rails at \$16.75 @ \$17 for short lengths, \$16.50 for miscellaneous lengths and \$17.25 for long lengths, which do not require any sorting. We omit quotations on Old Iron Rails, as there have been no sales here for months.

Railway Track Supplies.—A moderate amount of business is moving and prices are ruling about as follows: Spikes, 2.15¢, 30 days; Splice Bars, 1.70¢ @ 1.80¢; Track Bolts, 2.65¢ with Square and 2.75¢ for Hexagon Nuts.

Chicago.

(By Telegraph.)

Office of The Iron Age, 59 Dearborn street, CHICAGO, March 16, 1893.

Reduced freight rates from Eastern points go into effect on the 28th. The rates from Pittsburgh to Chicago will then be 15¢ per 100 on Finished Iron and Steel, from Youngstown 13¢ and from Findlay and Toledo 11¢. The valley manufacturers are endeavoring to have their rate reduced to 12¢, which would seem to be more equitable. Consumers are now getting the benefit of the reduction on new business. The market here has been quiet for the past week on all heavy goods, but the jobbing houses are doing an immense trade.

Pig Iron.—Local Coke Iron is in fair demand in small lots, but large consumers are either well stocked for the present, or are waiting for some indication that bottom has been reached. The largest producers here are making a firm stand on their quotations, and refuse to meet the extreme prices now current. Reports from the South are conflicting. An offer of \$9, Birmingham, for 10,000 tons Gray Forge is said to have been refused, but, on the other hand, consumers say that they have had offers of Southern Coke at figures much under the price of corresponding grades of local Coke. It is safe to assume that not all Southern companies are disposed to engage in the reckless competition which some of them have precipitated in their efforts to sell for immediate delivery for cash. Lake Superior Charcoal is quiet, and the makers are not endeavoring to force business. Quotations as follows:

Lake Superior Charcoal.....	\$17.00 @	\$17.50
Local Coke Foundry, No. 1.....	14.50 @	15.00
Local Coke Foundry, No. 2.....	13.75 @	14.25
Local Coke Foundry, No. 3.....	13.50 @	14.00
Local Scotch.....	15.50 @	16.00
Ohio Strong Softeners.....	17.25 @	17.75
Southern Coke, No. 1.....	15.50 @	15.75
Southern Coke, No. 2.....	14.00 @	14.75
Southern Coke, No. 3.....	13.75 @	14.00
Southern, No. 1, Soft.....	14.00 @	14.75
Southern, No. 2, Soft.....	13.75 @	14.00
Southern Gray Forge.....	13.25 @	13.50
Southern Mottled.....	13.00 @	13.50
Tennessee Charcoal, No. 1.....	17.50 @	18.00
Alabama Car Wheel.....	21.00 @	23.00
Coke Bessemer.....	16.50 @	17.00
Hocking Valley, No. 1.....	17.25 @	18.50
Jackson County Silvery.....	17.50 @	18.00

Spiegel.—Spiegel is firm at \$28 for 20 ¢, but only a light trade is doing.

Bar Iron.—Inquiries are better and the general demand has shown other encouraging signs of improvement. Carload orders are more frequent, jobbers are having a largely increased demand from stock. Mill shipments on straight Bar orders are fairly quotable at 1.60¢ @ 1.65¢, half extras, Chicago, but good specifications have secured concessions from these figures. Jobbers quote 1.80¢ @ 1.90¢ from stock. Soft Steel Bars are steady at 1.75¢ @ 1.85¢ from mill and 1.90¢ @ 2¢ from store.

Structural Shapes.—Beams have only moved in small lots, as building projects are being kept back until the usual annual labor disputes are adjusted. A great deal of figuring is being done on bridge work. Mill shipments are quoted at 2.25¢ @ 2.50¢ for Beams and Channels, 1.95¢ @ 2.10¢ for Angles, 2.50¢ for Tees and 2¢ @ 2.10¢ for Bridge Plates.

Plates, Tubes, &c.—Dealers report a much larger volume of business in Plates and Tubes the past week, but it is ascribed to an accumulation of orders hanging fire for some time. Very low prices were made. Dealers have an advantage in their large stocks, which they are now using, hence the mills have had but little chance to sell direct to consumers.

Sheets.—Black Sheets have been dull, but are steady at about 2.85¢ @ 2.90¢ for

No. 27 in carload lots. Galvanized Iron is only moving in small lots, and concession have been made by some of the mills.

Merchant Steel.—Orders for both Tool Steel and cheap Steel have been much larger of late. Open Hearth Machinery, Tire and Spring Steel is quoted at 2¢ @ 2.25¢ in carload lots, according to quality and finish.

Track Supplies.—The Union Works of Illinois Steel Company were started up last week on Light Rails, but will put on standard sections soon. Rail orders have been small of late, but prospects for future business are very encouraging. Quotations still range from \$31.50 upward. Splice Bars are quite firm at 1.80¢ for Iron and Steel. Spikes are steady at 2.15¢ @ 2.20¢ and Hexagon Nut Track Bolts are unchanged at 2.65¢ @ 2.75¢.

Old Rails and Wheels.—Old Iron Rails are nominally quoted at \$20, but no transactions are reported. Consumers appear to be well stocked and hesitate to make offers except at prices which would make purchases bargains. The quantity offered is large for the present condition of the market. Old Steel Rails are flat at \$13.50 @ \$14 for short pieces and \$14 @ \$14.50 for long lengths. Dealers quote Car Wheels \$16 @ \$16.25, but large lots could not be sold except at a considerable reduction on these rates.

Scrap.—There is more strength to Wrought Scrap than would be supposed considering prevailing conditions. Dealers have bid \$17.75 to railroads for No. 1 without success, and a sale of 300 tons of No. 1 Mill is reported at \$14, four months. Steel Scrap is quiet. Cast is in good demand at \$12 @ \$12.25 for heavy.

Metals.—Copper is looking up. Consumers have become somewhat excited at the report of a combination among producers and are inquiring anxiously. Quotations are fluctuating rapidly. Lake is quoted at 11¢ @ 11.25¢, car load lots, but may be higher by the time this reaches our readers. Sales of casting Copper were made Monday at 10.75¢, spot cash, and 11¢ is now asked. No change is noted in Spelter, which is still quoted at 4.40¢, with consumers buying sparingly. In Pig Lead trade generally has been very quiet, brokers reporting values ruling at and around 3.97½¢ and 4¢, with sales of some 200 tons late March.

Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, Pa., March 15, 1893.

Pig Iron.—The events of the past week have not been of a character to stimulate business, but on the contrary have caused considerable uneasiness in certain directions. The drop in prices by the Thomas Iron Company and the reported consolidation of the three leading Alabama companies have been the leading features, but the probable effect is not very clearly defined, although the general impression is that in the long run it will help prices rather than otherwise. But there is so much confusion and irregularity that buyers hardly know where they stand, consequently the majority are disposed to wait further developments before committing themselves to either side. Meanwhile a great deal of business has been done at low prices, one contract having been made for 12,000 tons No. 3 Alabama Iron at about \$13.50, Philadelphia, deliveries extending all through the current year. In other instances \$13.20, Harrisburg, has been accepted, and as low as \$15 for No. 1 for both Virginia and Alabama. For standard Pennsylvania brands, \$17 @ \$17.50 has been paid for No. 1, \$15 @ \$15.50 for No. 2x, and \$14 @ \$14.50 for

Gray Forge. These were, however, mostly in small lots, consumers being unwilling to do more than cover current requirements until they see a little further ahead. There is an impression among the most experienced men in the trade that prices are what they call "scraping bottom," and while there may be exceptional transactions at as low or possibly lower figures than any yet recorded, they are of the opinion that standard qualities are not likely to go below the figures named below, which are for Philadelphia and near-by deliveries, and 25¢ @ 50¢ less at Harrisburg or south of that point for brands on which freights are specially favorable:

American Scotch, No. 1x.....	\$17.50 @ \$18.00
American Scotch, No. 2x.....	17.00 @
Standard Penna (Lake Ore), No. 1x.....	17.00 @ 17.50
Standard Penna (Lake Ore), No. 2x.....	15.00 @ 15.50
Standard Penna (Lake Ore), No. 3x.....	14.50 @ 15.00
Lehigh and Schuylkill, No. 1x.....	16.25 @ 16.50
Lehigh and Schuylkill, No. 2x.....	15.00 @ 15.25
Standard Virginia, No. 1x.....	15.25 @ 16.00
Standard Virginia, No. 2x.....	14.50 @ 15.00
Medium Va. and Southern, No. 1x.....	15.00 @ 15.25
Medium Va. and Southern, No. 2x.....	14.25 @ 14.75
Standard Penna. and Virginia Forge.....	14.00 @ 14.50
Ordinary Forge Cinder mixed.....	13.00 @ 13.25
Hot-Blast Charcoal.....	18.50 @ 21.00
Cold-Blast Charcoal.....	24.00 @ 26.00

Muck Bars.—There is a little more inquiry, but owing to the large decrease in production, holders are asking about 50¢ advance. There are buyers at \$24.75 @ \$25, delivered, for good Bars, but they are held at \$25.25 @ \$25.50, and in some cases still higher figures are asked. Small lots taken at \$25 @ \$25.25 for near-by deliveries.

Steel Billets.—The demand is not large, although at the low figures accepted some days ago buyers intimate that they might be inclined to place good sized orders. Sellers quote \$25.25 @ \$25.50 for Philadelphia and near-by points, and \$25 @ \$25.25 Susquehanna Valley. The few sales closed were slightly lower than these figures, however, and consumers are not showing great interest in the market, even at the low prices above named.

Steel Rails.—The market is extremely dull, but prices are firmly maintained at \$30, f.o.b. cars at mills. Nothing but small lots are called for at present, and manufacturers are somewhat disappointed at the limited amount of business forthcoming. As regards the report that the Cleveland Rolling Mill Company are likely to start in on Rails, we have it on the highest authority that they have no such intention at present. They have made no preparation for anything of that kind, either as regards sales or in their plant, so that whatever they may do at some other time, they have no present intention of rolling Rails.

Bar Iron.—There is no particular change in this department, the demand being still much smaller than usual at this season of the year. Strictly first-class Iron commands 1.70¢ @ 1.75¢ for city delivery, but at interior points 1.60¢ @ 1.65¢ are not unusual figures, and for Steel Bars we hear of even still lower prices than quoted for Iron. Expectations of a better demand are very generally indulged in, but at the moment there is nothing in sight likely to bring it about.

Plates.—Business is said to be a trifle better as regards small lots, but large orders, while still among the things hoped for, are not perceptibly nearer than they were a week ago. There is no doubt, however, that a great deal of business will have to be placed within the next 30 days, but as much of this will be required in the West, the chances are not strongly in favor of Eastern mills securing it. However, it may cause less competition for Eastern business, and to that extent will be of

some advantage. Meanwhile, prices show no improvement, and while lower figures have been named in special transactions, ordinary asking prices are about as follows:

	Iron.	Steel.
Tank Plates.....	1.80 @ 1.90¢	1.85 @ 1.95¢
Shell.....	2.15 @ 2.20¢	2.15 @ 2.20¢
Flange.....	2.70 @ 2.90¢	2.40 @ 2.50¢
Fire-Box.....	3.00 @ 4.00¢	2.70 @ 3.20¢

Structural Material.—There is very little doing beyond the usual routine demand for small lots, which are taken at about the same figures as ruling for several weeks past. There is some prospect of several good orders being on the market soon, but in the meanwhile mills are all more or less short of work, and would probably make very low offers on the chance of getting something for immediate specification. Sales chiefly at about the following figures, viz.: From 1.85¢ to 2¢, delivered, for Bridge Plates; 1.9¢ @ 2¢ for Angles, and 2.25¢ @ 2.40¢ for Beams, Channels or Tees.

Postscript.—The Passaic Rolling Mill Company have secured the 400 ton order for the Harlem Viaduct, by taking the entire work, including the masonry.

Sheets.—The general demand is slow and disappointing, although one or two very large orders have been placed, but at extremely low figures. In one case 10,000 bundles were taken, and in others considerable quantities were taken by dealers, who regard prices low enough to warrant heavy purchases. Small lots of best makes are quoted about as follows:

Best Refined, Nos. 14 to 20.....	2.20¢ @ 2.40¢
Best Refined, Nos. 21 to 24.....	3.10¢ @
Best Refined, Nos. 25 to 26.....	3.20¢ @ 3.25¢
Best Refined, No. 27.....	3.40¢ @
Best Refined, No. 28.....	3.50¢ @

Common, $\frac{1}{2}$ ¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about $\frac{1}{4}$ ¢ lower than are here named:

Best Soft Steel, Nos. 14 to 20.....	3¢ @ 3 $\frac{1}{2}$ ¢
Best Soft Steel, Nos. 21 to 24.....	3 $\frac{1}{2}$ ¢ @
Best Soft Steel, Nos. 25 to 26.....	3 $\frac{1}{2}$ ¢ @
Best Soft Steel, Nos. 27 to 28.....	4¢ @

Best Bloom Sheets, $\frac{1}{2}$ ¢ extra over the above prices.

Best Bloom, Galvanized, discount.... @ 67 $\frac{1}{2}$ %

Common, discount... @ 70 %

Old Material.—The market is in a most depressed condition, there being little or no demand, while sellers are extremely anxious to realize. Prices are nominally as quoted herewith, but there is no certainty of a market being found for any but small lots at about the following figures: Iron Rails, \$20.50 @ \$21 asked, spot, or \$22 delivered; Steel Rails, \$16 @ \$17, delivered; No. 1 Railroad Scrap, \$19.50 @ \$20, Philadelphia, or for deliveries at mills in the interior \$20 @ \$21, according to distance and quality; \$14.50 @ \$15 for No. 2 Light; \$14 @ \$14.50 for best Machinery Scrap; \$13 @ \$13.50 for ordinary; \$14 @ \$15 for Wrought Turnings; \$9 @ \$10 for Cast Borings, and nominally \$22 @ \$24 for Old Fish Plates, and \$16 @ \$16.50, delivered, for Old Car Wheels.

Louisville.

LOUISVILLE, KY., March 14, 1892.

There has been a fair amount of buying, purchasers desiring Iron for prompt delivery. In general, consumers have not cared to buy Iron for delivery extending further than their immediate wants and to enable them to fill contracts already taken. There have been a few exceptions to this policy, sale of several thousand tons for delivery through the year, shipments to begin in May, having been effected to pipe works. It is reported the prices were made at figures ruling to-day of about \$9.25 for Gray Forge at furnace.

Stocks continue to accumulate, and so far there has been no shutting down on the part of furnaces.

Toward the close of the week the indications are strong that a consolidation of two of the largest companies in the South has been decided upon, same to be under one management. Furnaces and consumers both have been interested in knowing whether it would affect the price of Iron. The general opinion among consumers has been that, for the present at least, prices will remain the same, as there are large blocks of Iron held at furnaces, and many outside companies are in position to meet the demands of those wishing to buy. The general effect, it is felt, is that in time they will be able to largely control the market for Southern Iron and to make prices which will be largely followed by those out of the combination. It is felt that the uniting of the companies in many respects will be of benefit to the Iron trade and to those interested in making the combination.

There has been no improvement in Car Wheel Irons and but few sales.

Old Car Wheels are held in the neighborhood of \$16.

We quote for cash, f.o.b. cars, Louisville:

Southern Coke, No. 1 Foundry....	\$14.00 @ \$14.50
Southern Coke, No. 2 Foundry....	13.00 @ 13.50
Southern Coke, No. 3 Foundry....	12.50 @ 12.75
Southern Coke, Gray Forge.....	15.00 @ 12.25
Southern Charcoal, No. 1 Foundry....	15.75 @ 16.75
Southern Car Wheel, standard brands.....	18.00 @ 19.00

Cincinnati.

(By Telegraph.)

Pig Iron.—The Iron market shows no signs of improvement as far as prices go for contracts for forward delivery, and, when it is desired to sell, buyers demand deliveries throughout the year, but many refuse to entertain bids so far in advance, and while there are rumors of sales on the basis of \$9, for Gray Forge, they are not well authenticated. There were sales of 8000 tons of No. 1 Soft and No. 2 Foundry and Soft running through the year, but the price obtained was kept secret. There have been sales of Mottled Iron as low as \$8.75 at the furnace, and it is said that even this price has been shaded. No. 2 Foundry has been offered as low as \$10.25 at the furnace and the order not secured. The market, as a whole, appears to be very much demoralized, and it is evidently the increase in stocks which has accomplished this, but when the report is analyzed it is found that stocks have not increased in the Southern furnaces in which this market is the most interested, but the gain is almost wholly in the Northern districts. There is a satisfactory volume of orders for current consumption, which are mainly for orders of known brands and qualities which have been tested and not found wanting and for which more satisfactory prices prevail. Standard Charcoal Car Wheel Iron is in active demand and more could be sold than is at present available, but the lower grades are plenty and dull. We quote:

Foundry.

Southern Coke, No. 1.....	\$14.25 @ \$14.50
Southern Coke, No. 2.....	13.00 @ 13.25
Southern Coke, No. 3.....	12.25 @ 12.50
Ohio Soft Stone Coal, No. 1.....	16.00 @ 16.50
Ohio Soft Stone Coal, No. 2.....	15.00 @ 15.50
Maloning and Shenango Valley.....	17.00 @ 17.50
Hanging Rock Charcoal, No. 1.....	19.75 @ 20.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1.....	16.50 @ 17.00
Tennessee and Alabama Charcoal, No. 2.....	15.50 @ 16.00

Forge.

Gray Forge.....	12.00 @ 12.25
Mottled Neutral Coke.....	11.50 @ 11.75

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	19.75 @ 20.00
Lake Superior Car Wheel and Malleable.....	18.75 @ 19.00

St. Louis.

Office of *The Iron Age*,
Bank of Commerce Building,
St. Louis, March 14, 1892.

Pig Iron.—The market is in such condition that the least said about it the better. There is no use disguising the fact the market is in a critical condition, and unless more of the Southern furnaces decide to close down than have already decided to do so, the immediate future will contain nothing that is encouraging in any shape whatever. Desperate cases require desperate remedies and the only remedy for the market is to curtail production, as it has been fully demonstrated that the legitimate demand is not of sufficient magnitude to keep on a parity with production. At the moment buyers have much their own way regarding prices, time, delivery, &c., which is, of course, anything but pleasant to the furnacemen. The condition of the market is such, however, that this is the natural result, and is something which cannot be avoided. The proposed consolidation of the leading Southern furnaces has as yet no effect on the market, although it is quite reasonable to assume that should the consolidation ensue, the market will quickly respond. During the week under review the demand has been of a hand-to-mouth character, and the market is without special features. We quote as follows for cash, f.o.b. St. Louis.

Southern Coke, No. 1 Foundry.....	\$14.10 @ \$15.00
Southern Coke, No. 2 Foundry.....	13.75 @ 14.25
Southern Coke, No. 3 Foundry.....	13.00 @ 13.50
Gray Forge.....	12.50 @ 12.75
Southern Charcoal, No. 1 Foundry.....	16.75 @ 17.25
Southern Charcoal, No. 2 Foundry.....	16.00 @ 16.50
Missouri Charcoal, No. 1 Foundry.....	15.25 @ 15.75
Missouri Charcoal, No. 2 Foundry.....	14.75 @ 15.25
Ohio Softeners.....	17.75 @ 18.75

Bar Iron.—There has been quite a falling off in the demand during the past week, and mills are fast reaching their last orders. The railroads who were expected to be steady buyers for some time yet have suddenly withdrawn from the market, and do not seem disposed to negotiate for material even at the low prices that are ruling to-day. We hear of some extremely low prices, but these as a rule are made by mills who, even when prices are firm, have to shave them to secure business. The effect of these low quotations is depressing and their influence bad. We quote as follows: Car lots at East St. Louis, 1.62½¢ @ 1.67½¢, half extras; lots from store, 1.75¢ @ 1.80¢, according to quantity.

Barb Wire.—The volume of business continues to be of good dimensions, and mills are more than well supplied with orders. Prices, however, are being cut to the country trade, and, while the cut has not become general, it will soon cause a lower range of values unless they are shortly withdrawn. We quote as follows: Less than car lots of Painted, \$2.60; Galvanized, \$3.05. Carload orders are quoted at 10¢ per hundredweight less than these prices.

Wire Nails.—The demand for Wire Nails continues to be of a light character. A meeting of the manufacturers was held in Chicago last week, at which time it was decided to maintain the recent advance. We quote as follows: For medium sized orders the \$2.05 rate prevails, while jobbers quote \$2.10 @ \$2.15 for small lots. Mills quote \$1.95 for carload orders.

(By Telegraph.)

Metals.—Business in Pig Lead is almost at a standstill. The demand is light and offerings are freely made at 3.92½¢ @ 3.95¢. Good round lots could

no doubt be bought at 3.90¢. Present indications point to lower prices in the near future and it will require a spirited demand to prevent a decline. The same report will also apply to Spelter. Reports from smelters prove that stocks in their hands are rapidly accumulating and to dispose of a portion of this stock to-day would mean prices that would be much lower than those nominally quoted, which are from 4.22½¢ to 4.25¢ for delivery extending over the next 90 days. The outlook is discouraging and lower prices quite probable.

Cleveland.

CLEVELAND, Ohio, March 14

Iron Ore.—There is but little change to report, although prices seem a trifle less firm. It is admitted that the high-grade Ores containing 65 @ 66 % of iron and from 0.009 to 0.015 % of phosphorus are selling as low as they did last year—\$5.75 @ \$6 per ton. The best grades of Hematites are probably not bringing over 15¢ @ 25¢ advance. Indeed, just at present only a small amount of Ore is being sold, although it is claimed that something is being done all the time. Additional charters from Ashland and Two Harbors at \$1.25 per ton are reported, although the names of vessels are withheld and it is strongly intimated that the transportation rates from all the Ore shipping ports will be forced down from 10¢ to 15¢ per ton before navigation opens. Two or three sales of non-Bessemer Ore at about \$3.70, Cleveland delivery, are reported, but the amounts involved were small. Last season's Ore is being pushed forward to the furnaces as rapidly as the railroads can furnish cars. An indication of the endeavors in this direction can be obtained from the statement that 35,000 tons were shipped from Cleveland during the past seven days, as compared with 10,900 tons for the same week in 1891.

Pig Iron.—Dealers say that there is absolutely nothing new to report. The situation is very discouraging, although furnacemen talked with to-day do not seem to believe that the depression will be long continued. Many furnaces are being banked, a large portion of them, in fact, except those engaged in turning out special Iron. No sales of importance are reported, but it is expected that the reduced production will have a beneficial effect. Prices are unchanged, for the reason that the demand does not warrant any increase, and they could not well go lower.

Old Rails.—We hear of a sale of 500 tons of Old Americans at \$21, but the market is not very active. The inquiries from buyers are, however, more numerous than for several weeks past, and dealers quote \$21 @ 21.50 to day.

Manufactured Iron.—No. 1 Bar Iron is still quoted at 1.60¢ @ 1.65¢, although the demand seems to be decreasing. Sheets remain firm and somewhat scarce.

Nails.—Business is only fairly good. Prices remain unchanged at \$1.80 for Steel Wire Nails and \$1.62 for Steel Cut Nails.

Scrap.—Only a fair demand is reported, and business is conducted on the basis of \$18 @ \$18.50 for No. 1 Railroad Wrought and \$12.75 for Cast Scrap.

Detroit.

WILLIAM F. JARVIS & Co. of Detroit, Mich., report under date of March 14, 1892: The large business of last week which we reported was followed by a fall-

ing off in transactions generally, and no sales of any magnitude were consummated here for any grade of metal. To be sure, there were some inquiries left unfilled, but the week was a decidedly dull one. A few carload lots of Lake Superior Charcoal changed hands, but the market generally was spiritless, with no change in prices. We quote the market as follows:

Lake Superior Charcoal, all numbers.....	\$17.00 @ \$18.10
Lake Superior Coke, Bessemer.....	16.50 @ 17.00
Lake Superior Coke Foundry, all ore.....	17.00 @ 18.00
Ohio Blackband (40 per cent.).....	17.50 @ 18.00
Southern No. 2.....	15.25 @ 15.50
Southern Gray Forge.....	13.50 @ 14.00
Jackson County (Ohio) Silvery.....	18.00 @ 18.20

New York.

Office of *The Iron Age*, 96-102 Reade street,
NEW YORK, March 16, 1892.

American Pig.—The majority of sellers report the market exceedingly dull, buyers being utterly unwilling to take hold, and purchasing merely to cover immediate requirements. The Thomas Iron Company have directly and through brokers received inquiries from parties not regular customers, but have declined to sell to them at the new prices. Merchants who handle Lake Superior and Southern Charcoal Irons report some business as the outcome of the car orders recently placed. We quote Northern brands, \$15.75 @ \$16 for No. 1; \$14.75 @ \$15 for No. 2, and \$13.75 @ \$14 for Gray Forge, tidewater. Southern Iron sells at \$15.50 @ \$16.50 for No. 1; \$14.75 @ \$15.50 for No. 2 and No. 1 Soft, \$13.75 @ \$14.25 for No. 2 Soft; \$13.25 @ \$13.50 for Gray Forge.

Ferromanganese and Spiegeleisen.—The market is lifeless, with Spiegel nominally quotable at \$23 @ \$23.50 for 10 to 12 %; \$26.50 @ \$27 for 20 %, and \$62.50 @ \$63 for Ferromanganese.

Billets and Rods.—The market is very dull in this section. A purchaser has been found for a lot of 500 tons of foreign Billets which went into store recently and another lot of 500 has also been placed, both at very low prices. Domestic Billets may be quoted \$25.50 @ \$26, and domestic Rods \$35.50 @ \$36, tidewater.

Steel Rails.—One Eastern mill shared in the Baltimore and Ohio order of 11,500 tons, the balance being taken by Western mills on the line. A good deal of interest has been aroused by the placing of an order for 4500 tons of 45-lb rails, to be delivered over a period of eight months at Cartagena, South America, Boston parties being interested in the scheme, so that the business was done from this side. It is understood that the order was taken by the Cammells at \$4, f.o.b., from which must be deducted the freight from mill to seaboard, so that the English mill sold the lot at an exceedingly low price, considering the fact that they are Light Rails. It is believed that heavy sections, on this basis, could be obtained for £3. 18/6, which would land English Rails at Gulf ports at about \$4. 9/ or, including duty, at \$35, against \$33.50 @ \$34 for American. On the Pacific Coast the figures would come closer. We continue to quote \$30 at Eastern mill.

Manufactured Iron and Steel.—The principal event of the week has been the opening of bids on the McComb's Dam Bridge, which was taken by the Passaic Rolling Mill, although its bid on the work was about \$40,000 above that of the Union Bridge Company. We present the details elsewhere. Beams continue very dull. The mills are eagerly scouring the country for business, and low quotations are being made, in spite of the fact that as yet there is little business to fight for. Strenuous efforts are being made to induce architectural works to commit

themselves to season's contracts, and it is intimated that 2.10¢ would be accepted. Small lots are selling at 2.40¢ @ 2.45¢, and round lots at 2.25¢ @ 2.30¢. There seems to be very little in the talk of a renewal of the old Beam pool. The Plate market is exceedingly demoralized and very low figures are being made. We quote: Angles, 1.9¢ @ 2.10¢; Sheared Plates, 1.85¢ @ 2.25¢; Tees, 2.40¢ @ 2.75¢; and Beams 2.30¢ @ 2.80¢; Channels, 2.30¢ @ 2.50¢, on dock. Car Truck Channels, 2¢ @ 2.10¢; Steel Plates are 1.85¢ @ 1.95¢ for Tank; 2.15¢ @ 2.30¢ for Shell; 2.40¢ @ 2.65¢ for Flange; 2.60¢ @ 2.75¢ for Marine, and 3¢ @ 3.25¢ for Fire Box, on dock. Bars are 1.7¢ @ 1.9¢, on dock. Scrap Axes are quotable at 2¢ @ 2.20¢, delivered. Steel Axes, 2¢ @ 2.2¢, and Links and Pins, 2.1¢ @ 2.20¢; Steel Hoops, 1.9¢ @ 2.05¢, delivered.

Merchant Steel.—We quote: Hot-Rolled Shafting, 1.90¢ @ 2¢; Machinery, 1.90¢ @ 2.10¢; Tire, 2¢ @ 2.25¢, and Toe Calk, 2.20¢ @ 2.35¢, delivered.

Track Material.—We quote Spikes, 3¢ @ 3.25¢; Angles, 1.65¢ @ 1.70¢, and Bolts, 2.60¢ @ 2.75¢, delivered.

Joseph P. Mason, sales agent of the Pottstown Iron Company of Pottstown, Pa., makers of Plates and Cut Nails, has removed to the Columbia Building, 29 Broadway.

T. D. Hazard of 80 Wall street has just issued, in pamphlet form, his review of the Iron trade of New York for 1891. Mr. Hazard has for many years prepared this report for the Chamber of Commerce.

Metal Market.

Copper.—In the matter of rumors current of late regarding an agreement between producers to reduce output and regulate selling prices, nothing positive has come to the surface, but circumstantial evidence that some sort of "deal" has been entered into is stronger at the present time than it was a week ago, not only in this but in the European markets. Prices for the metal have ruled higher in both quarters, and a very suggestive advance has taken place also in shares of mining companies on both sides of the Atlantic, while the offering of Copper is remarkably reserved in the face of the indifferent attitude assumed latterly by consumers. Reports have had circulation to the effect that the output of the Anaconda mines is more or less seriously checked by an accident at the main shaft, and it is significant in this connection that prices of common casting Copper have advanced relatively more than have those for Lake Superior product. Of the latter sales have been made at 11¢ for early delivery, and it is asserted that buyers are now anxious to stock up at a fraction less, while 11½¢ is said to have been refused for considerable quantities for future delivery. At the moment there are few, if any, sellers at less than 11½¢. Casting brands have brought 10½¢ @ 10¾¢ in fair-sized lots, and 10½¢ @ 11¢ in single carloads. The last named prices are now generally asked. Fairly large purchases of Matte for European account have been made during the week at slightly higher average prices, but no export movement of importance in fine Copper can be traced.

Pig Tin.—The condition of the market appears to be practically the same as it was a week ago. London prices have not fluctuated to an extent that would excite interest, but some prominent local operators still make quite stiff offers on round lots for near future delivery, in the face of continued sharp competition for out-

town business and advices by cable of comparatively large shipments from the Straits during the last half of March. The latter are estimated at 2375 tons, including 425 tons to the Continent, against a total of 2325 tons for the entire month of February. Ten-ton lots have been sold for delivery this month and next at 19.65¢, cash, and 5-ton lots went to the out of town trade at 19.70¢. Small jobbing parcels sold at 19.85¢ @ 20¢, according to terms.

Lead.—The demand for this metal is without perceptible improvement. Corroders, to all accounts, have enjoyed a very good trade in their products thus far this month and a full seasonable distribution of most varieties of manufactured Lead is noted also, but purchases of Pig Metal are still conducted in an extremely conservative manner. In other quarters the buying is equally as cautious, and, while supplies are not offered with any remarkable pressure, prices have ruled a shade easier, with 4.20¢ the top for immediate or near future shipments. In a few instances where exceptional conditions prevailed, 4.15¢ was touched, but that price is bid at the moment.

Spelter.—Western brands are still quoted at 4.55¢ @ 4.60¢ in carload lots, but, despite the comparative cheapness of the metal and the fact that additional quantities are going to European markets, consumers buy in a very indifferent manner. In this market the current sales are not equal to those of the corresponding period of last year although prices are lower by about ½¢ @ 1¢ and the natural influence of the liberal stock in smelters' hands thus discounted to a great extent.

Antimony.—Ordinary jobbing parcels are about all that have found sale, and prices are without remarkable change. Current quotations are 10½¢ for Hallett's, 12½¢ for LX and 14½¢ @ 15¢ for Cookson's, in wholesale quantities.

Tin Plate.—Light-weight Coke finish Plates for future delivery have met with moderately free sale, but in others the movement is still rather slow. Goods on the spot are quiet and move at practically the same prices that have ruled for several weeks. We quote as follows for full weights: Coke Tins—Penlan grade, IC, 14 x 20, \$5.25; J. B. grade, do., \$5.35; Bessemer do., \$5.30; Siemens Steel, \$5.37½. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60 @ \$5.65; Siemens Steel, IC basis, \$5.75 @ \$5.80; IX basis, \$6.80. IC Charcoals—Melyn grade, ¼ X, \$6.40; for each additional X add \$1.50; Allaway grade, \$5.75; Grange grade, \$5.85; for each additional X add \$1.20. Charcoal Terns—Worcester, 14 x 20, \$5.75; do., 20 x 28, \$11.35½; M. F., 14 x 20, \$7.37½; do., 20 x 28, \$14.75; Dean, 14 x 20, \$5.50; do., 20 x 28, \$10.60; D. R. D. grade, 14 x 20, \$5.35; do., 20 x 28, \$10.25; Mansel, 14 x 20, scarce; do., 20 x 28, \$10.50; Alyn, 14 x 20, \$5.45; do., 20 x 28, scarce; Dyffryn, 14 x 20, \$5.65; do., 20 x 28, \$10.90. Wasters—S. T. P. grade, 14 x 20, \$5.10; do., 20 x 28, \$10; Abercarne grade, 14 x 20, \$5; do., 20 x 28, \$9.70.

Coal Market.

The dullness characteristic of this time of the year prevails in the Coal trade. The supply coming forward is more ample than the consumption, and the stock is accumulating. The production of the Schuylkill region is reduced by one-third. The Keystone Mine is exhausted, others are silent and in process of repair. For manufacturing purposes there is an active demand. Prices remain about the same. Domestic Coal is in diminished request.

The Reading combination seems to ex-

cite more curiosity than anxiety. Much speculation prevails as to its purposes, and as to its probable success in passing the ordeal of the courts. The validity of the act of the New Jersey Legislature, which the Governor is likely to sign, is questioned, on some constitutional ground of a failure to give public notice. Popular opinion seems to be favorable to the combination, with a strong counter current of distrust.

The shipments from the Anthracite regions for the week ending March 5, compared with those of the corresponding period in 1891, to March 7, show a net increase of 102,552 tons, taking an estimated total for the week in this year of 695,561, as against the total of 593,009 in 1891. The increase for the year to date was 344,682 tons.

The sales agents are in session at the New Jersey Central Railroad Building, New York, at the time of closing this article, 1 p.m., Wednesday, 16th inst.

Financial.

The stock market in the early part of last week was lower and fluctuating, owing to the favor shown by the House of Representatives to the forced coinage of silver, the impending legal proceedings in Pennsylvania against the Reading combination and the struggle over the control of the New England road. But there was a rally on Wednesday, based on the report of a good understanding between the Reading and Erie companies. News of the New Jersey act sanctioning the Reading consolidation gave another lift on Friday, aided by the report that the Franklin Refinery Company had been absorbed by the American. The Richmond Terminal, as well as the American Refinery, were higher on Saturday, while free selling of Reading made the market fall off in the afternoon. St. Paul seemed to suffer none by the passing of the dividend. On Monday the market was sluggish, with an upward tendency, Reading leading, but closing at 57½. Lake Shore declined 1½, and Richmond Terminal preferred advanced ¼. There is a question whether the New Jersey act as to the Reading will hold in the courts, but the Governor is expected to sign it. The market closed heavy on Tuesday, after various fluctuations.

The money market last week was unchanged; loans were made at 2% and 1½% for call, and on the 15th inst. closed at 2%. Time contracts favored the leaders. The rate was 3% for 30 days, 3½% for 60 to 90 days, 4% for four to five months and 4½% for six to eight months, on good Stock Exchange collateral. The rates were unchanged on Tuesday, 15th inst. The bank surplus reserve was reduced to \$16,196,450, having lost \$5,496,300 in cash and \$5,095,775 in surplus reserves. Call loans on Monday were 2%.

The bank totals of March 12 compare as follows with those of March 5:

Loans and discounts.....	Increase.....	\$4,258,700
Specie.....	Decrease.....	4,024,000
Legal tenders.....	Decrease.....	1,472,300
Deposits.....	Decrease.....	1,602,100
Circulation.....	Decrease.....	26,900

The bids for Government bonds on the 15th inst. were:

	First board.	Last board.
U. S. 4½s, 1891, extended.....	100	@ 100
U. S. 4s, 1907, registered.....	116	@ 116
U. S. 4s, 1907, coupon.....	117	@ 117
U. S. currency 6s.....	109	@ 109

Commercial paper was in fair demand, at 4% for indorsed bills receivable, 60 to 90 days, 4½ to 5% for acceptances at four months, and 5 to 6% for four to six months, paper having single names only.

Exports of gold were \$500,000. Exchange was firm, closing on Friday and Saturday at \$4.86½ for long, and \$4.88½ for short, after having been \$4.86 and \$4.88, respectively, on Monday.

Imports.

Hardware, Machinery, &c.

Aich, M., Ironware, cs., 40
 Armstrong Bros & Co., Machine, cs., 1
 Abbot, J. & Co., Steel, cs., 53; Bars, 10; bale, 1;
 Bars, bdis., 50
 Atlas S. S. Company, Hdw., kegs, 45
 Abbott, Jere & Co., Steel, pkgs., 41
 Allado, F. & Co., Machy., cs., 2
 Boker, H. & Co., Wire, cs., 5; Steel, pce., 1; Steel-
 ware, cs., 1; Hdw., cs., 1; Hdw. and Cutlery,
 cs., 2; Hdw., cs., 2; Gun Stocks, bdis., 41
 Borgfeldt, & Co., Ironware, cs., 9
 Blumenthal & Bros., Hdw., cs., 1
 Baring Bros. & Co., Steel Plates, 100 tons
 Botany Worsted Mills, Machy., cs., 20
 Brown Bros. & Co., Steel Strips, cs., 23; Iron,
 bdis., 114; Wire Rods, coils, 2838
 Balo, A. V., Ironware, cs., 13
 Bing, F. & Co., Hdw., pkgs., 11
 Bruce & Cook., Tin Plates, cs., 891
 Coddington, T. B. & Co., Tin and Terne Plates,
 1122; Sheet Iron, bdis., 917; ditto, bdis, 1162;
 Tin Plates, bxs., 1210
 Canadian Bk. of Commerce, Tin Plates, bxs., 900
 Clark, H. F., Mach'y, cs., 1
 Dolge, A. Steel Wire, cs., 11
 Dingelstedt & Co., Metal Ware, cs., 1
 Dieckhoff, Raffloer & Co., Hdw., cs., 10
 Downing, R. F. & Co., Iron Girders, 87
 Davis & Co., Moses, cs., 9
 Fuchs & Lang, Mach'y, pgs., 31
 Greiner, E., Brassware, cs., 1
 Goodwin, S. & Sons, Ironware, cs., 6
 Hammacher, Schlemmer & Co., Nails, cs., 38;
 Steel Wire, cs., 20
 Hammill, Hylander & Co., Metal Ware, cs., 1
 Hampton, J. W., Tin Goods, cs., 30
 Hartshorn, S., Rods, bdis., 218
 Hampton, J. W., Jr., Mach'y, cs., 1
 Hartley & Graham, Arms, cs., 1
 Irwin, Thos. & Sons, Hdw., pkgs., 6
 Knauth, Nachod & Kuhne, Ironware, cs., 24
 Kastor, A. & Bros., Steelware, cs., 30
 Kennedy & Moon, Mach'y, pgs., 16; Steel Tubes,
 cs., 6
 Krause & Seimis, Mach'y, pkgs., 13
 Lazard Freres, Tin Plates, bxs., 1625; Steel Wire
 Rods, pkgs., 314; Tin Plates, bxs., 35
 McCoy & Co., Ironware, pkgs., 68
 Montgomery & Co., Steel Wire, cs., 9
 Merchants Desp. Company, Anvils, 50
 Meyer, Strouse & Co., Steel, cs., 10
 Morgan's Sons, E., Tinfoil, cs., 15
 Morris, L. W. & Son, Steel Castings, 20
 McKesson & Robbins, Iron Cylinders, 2
 Musick, C. S., Tin Plates, bxs., 250
 Noyes, Smith & Co., Hdw., cs., 4
 Paik Bros., Steelware, cs., 4
 Pedersen, G., Hdw., cs., 1
 Pim, Forwood & Co., Hdw., pkgs., 24; Iron,
 pkgs., 7; Gal. Iron, cs., 20
 Phelps, Dodge & Co., Tin Plates, bxs., 2462
 Royal Trimming Company, Mach'y, cs., 4
 Richard, C. B. & Co., Hoop Iron, pgs., 11
 Rankin, James, Axes, 12
 Sutro, R., Ironware, cs., 3
 Sartorius, A. & Co., Metal Leaf, cs., 2
 Steinhardt, A. & Bro., Hdw., cs., 2
 Schoverling, Daly & Gales, Steel Plates, cs., 1;
 Hdw., cs., 1
 Smith, W. O. & Co., Mach'y, pgs., 2
 Schwarze, J. & Co., Mach'y, cs., 13
 Sneldon & Co., Steelware, cs., 1
 Salt, A. L., Tools, cs., 1
 Schall & Co., Tin Form, cs., 1
 Sickendorf & Co., Ironware, bxs., 5
 Ter Kuile, J., Hdw., cs., 9
 Thompson, L. & Co., Mach'y, cs., 31
 Vom Clee & Co., Ironware, cs., 10; Steelware,
 cs., 6
 Von Lengue & Detmald, Cartridges Empty,
 cs., 1
 Wilson, J. W., Mach'y, cs., 1
 Ward, Jas. E. & Co., Hdw., cs., 1
 Wessell, A., Plates Steel, 67; bdis. ditto, 13; bars,
 ditto, 12; cs., ditto, 2
 Wittenman Bros., Metal Ware, cs., 50
 Ward, James E. & Co., Anchors, 10; Chains, 3;
 Tin Plate, bxs., 75
 Wells, Fargo & Co., Steel Sheets, cs., 8 and 6;
 Iron, lengths, 30
 Wiebusch & Hilger, Hdw., cs., 9; Arms, cs., 48
 Whitteman, W. & Co., Tin Plates, bxs., 10
 Wagner, W. F., Steel, cs., 3; pl., 9; bars, 32;
 bdis., 252; Steel, cs., 23; bars, 21; bdis, 52
 Wiebusch & Hilger, Hdw., pgs., 8
 Order.—Mach'y, cs., 1; Wire Rods, bdis., 6; Iron
 Girders, 156; Steel Billets, 4201; Steel Wire,
 bdis., 104; Steel Wired Plates, cs., 11; Shells,
 pgs., 113; Wire, cs., 41; Hdw., cs., 2; Metal
 and Glass, cs., 2; Ironware, cs., 1; Rollers, 26;
 Mach'y, pgs., 25; Bessemer Steel, cs., 60; Tin
 Plate, bxs., 286; Steel Billets, 70; Steel Rods,
 215

It is reported that one of the largest lines of steamers from England to the United States will for the future coal here for the return voyages, and that the Belgian steamers will get their supply at home instead of at London. This is a result of the coal miners' strike.

The opinion, which has found frequent expression, seems to be well grounded, that the numerical strength in the House of Representative of the favorers of forced coinage of silver is due largely to the desire of Representatives to be re-elected, rather than to their convictions or personal preferences.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, March 16, 1892.

Prices for Pig Iron warrants, while irregular, have averaged somewhat higher, with business in Scotch at 41/, Cleveland at 36/7½ and Hematite at 46/3. The transactions in Scotch have been moderate, but dealings in Cleveland and Hematite larger than for some time past. The incentive to freer trading was the opinion that the Coal strike and cessation of work by 400,000 colliers, with forced suspension of operations at many large Iron works pending developments, will lead to still higher prices. Stocks in Connal's stores have decreased somewhat, the latest returns giving 496,000 tons Scotch, and 153,000 tons Cleveland.

Copper has been active and strong, with an advance in prices of about £2 during the week. Better demand from home consumers has helped the market, but the chief incentive was renewed reports of restriction of output in America and of European producers having been approached by American producers with a view to joint action. Reports of a cave in at the main shaft of the Anaconda Mine also had a marked influence upon prices.

Pig Tin has been almost neglected. About the usual business with consumers has taken place, but speculative interest appears to have been centered upon Copper almost exclusively.

Demand for Tin Plate has been slightly better, with the call chiefly for Cokes for Russia and Frisco. Charcoals and Ternes are still unusually slow for the season.

Scotch Pig Iron.—Trade in makers' Iron is very slow, and prices still irregular.

No.	Coltness, f.o.b. Glasgow	
No. 1	Coltness, f.o.b. Glasgow	53/
No. 1	Summerlee, "	50/
No. 1	Gartsherrie, "	49/
No. 1	Langloan, "	51/
No. 1	Carnbroe, "	44/
No. 1	Shotts, " at Leith	52/
No. 1	Glenarnock, " Ardrossan	50 6
No. 1	Dalmellington, "	48/
No. 1	Eglington, "	47/

Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 7/6.

Cleveland Pig.—The market is unsettled, and makers are now holding at about 37/ for No. 3, f.o.b. Middlesborough.

Bessemer Pig.—Movement slow, but makers very firm on price at 49/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—Scarcely any business and prices weak. English 20 % quoted at 77/6, f.o.b. shipping port.

Steel Rails.—Lower prices have been named without stimulating business. Heavy sections quoted at £4, f.o.b. shipping port.

Steel Blooms.—The market remains extremely flat. Makers ask £4 for 7 x 7, f.o.b. shipping point.

Steel Billets.—No change in demand and prices are nominal. Bessemer, 2½ x 2½ inches, quoted at £4. 5/, f.o.b. shipping point.

Steel Slabs.—Market very slow, and prices as before. Bessemer quoted at £4. 5/, f.o.b. at shipping point.

Old Iron Rails.—Demand is slow and the market rather weak. Tees quoted at £2. 15/ and Double Heads at £2. 17/6 @ £2. 18/9, f.o.b.

Scrap Iron.—Moderate sales making at about former prices. Heavy Wrought Iron quoted at £2. 10/ @ £2. 12/6, f.o.b.

Crop Ends.—Market remains quiet and unchanged. Bessemer quoted at £2. 12/6 @ £2. 15/, f.o.b.

Manufactured Iron.—No improvement in demand in any line and makers' prices as before. We quote, f.o.b. Liverpool:

	£ s. d.	£ s. d.
Staff. Ordinary Marked Bars	8 10 0 @
Common	6 10 0 @	6 12
Staff. Bl'k Sheet, singles	7 16 0 @
Welsh Bars (f.o.b. Wales)	5 10 0 @

Tin Plate.—There was a fair demand and the market is steady. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	14/ @	14/6
IC Bessemer Steel, Coke finish	12/6 @	12/9
IC Siemens	12/9 @	13/
IC Coke, B. V. grade 14 x 20	12/3 @	12/6
Charcoal Terne, Dean grade	12/ @	12/3

Pig Tin.—Business moderate, but market closes steady. Straits quoted at £89. 5/, spot, and £89. 10/ for three months.

Copper.—Market closes strong at an advance, and was active. Merchant Bars quoted at £46. 10/, spot, and £47, three months' futures. Best selected, £50.

Lead.—Business more active and the market steady at £10. 17/6 for Soft Spanish.

Spelter.—The market quiet and rather weak at £21 for ordinary Silesian.

Bids for the New McComb's Dam Bridge.

The Commissioners of Public Parks of New York have just made known the bids of the different companies for constructing the new McComb's dam bridge over the Harlem River at 155th street. Six companies competed for the contract, and their bids are given below:

	Specification M. Masonry and wall in mortar.		Specification N. Masonry and wall laid dry.	
	With rock asphalt.	With Tr. asphalt.	With rock asphalt.	With Tr. asphalt.
	Amount.	Amount.	Amount.	Amount.
T. & A. Walsh.....	1,202,004.55	1,195,079.55	1,189,534.35	1,182,609.35
Arthur McMullen.....	1,162,570.60	1,140,775.10	1,096,566.60	1,074,771.10
Passaic Rolling Mills Company....	1,102,531.80	1,091,146.80	1,074,663.05	1,063,288.05
Union Bridge Company.....	1,150,452.10	1,131,814.10	1,096,090.10	1,077,452.10
King Bridge Company.....	1,176,633.10	1,157,995.10	1,122,271.10	1,103,633.10
Hart, Anderson & Barr.....	1,186,874.20	1,166,069.20	1,103,992.30	1,083,217.20

HARDWARE.

Condition of Trade.

THE DEMAND for Hardware, both Shelf and Heavy, is undoubtedly affected by the condition of the Iron market, which prevents buyers from placing their orders as freely as they would if the tone of the market, as a whole, were stronger. As a result of this condition of things, buyers are rather cautious in placing orders, their purchases for the most part covering simply their early requirements. There are, however, indications that stocks in the jobbers' hands are running low, and some parties report an increased demand. It will be observed that in the reports from Hardware centers which are given below frequent reference is made to the condition of the roads, and there can be little doubt that this also has its effect in retarding business. In the matter of prices there have been but few changes since last week, and the tone of the market is about the same as for some time.

Chicago.

(By Telegraph.)

The Heavy Hardware jobbers report an unusually large volume of business. They are selling Iron and Steel from stock very freely, but the demand for wagon material has reached almost unprecedented proportions. The wagon makers are now running their works to their full capacity, and find much difficulty in securing Spokes and other material. Prices have advanced sharply. Harrow manufacturers have for various reasons been unable to get Harrow Teeth from the steel works and are now buying steel from jobbers and making the Teeth themselves. A very prosperous year is promised for the Heavy Hardware trade. The Shelf Hardware jobbers state that they are now enjoying about as large trade as they can comfortably handle. The demand is confined mainly to straight Hardware. Staple goods are moving fairly, but actively. The brass houses have had a sudden increase in their trade, buyers evidently being stirred up by reports of combinations among copper producers and brass rolling mills.

St. Louis.

(By Telegraph.)

Hardware jobbers report a general improvement in the demand for nearly everything which they carry in stock. The spring trade promises to be large, and from the purchases already made a large business is assured. The West and Northwest are heavy buyers, which will to a certain extent compensate for the extremely poor trade from the South. A good demand is noticeable for Shelf Hardware, and in Heavy Hardware job-

bers report a good trade. All things considered, the jobbers of Hardware have little to complain of, and unless something unforeseen happens the spring trade will likely prove as large as they can handle. Collections are good.

Louisville.

W. B. BELKNAP & Co.—As we intimated in our previous reports, business for the month of February was of fair volume and even encouraging. March is hardly as good. There seems to be less briskness and certainly no greater desire to stock up in anticipation of wants. There have been heavy rains over the Southern country and one or two cold waves, which latter always exercise a paralyzing effect, even in dead of winter, and if they come in the spring, when the nap has been worn off of winter clothes, and overcoat buttonholes unduly enlarged, the immediate influence is still more depressing. The present extreme low temperature for this season is locally damaging to the winter wheat crop, as we have not any protection of snow such as the Northwest enjoys along with its blizzards. Building prospects in the cities are not bad, but the best demand now is coming from the agricultural regions, particularly those where grain crops were raised last season. The large returns, both in volume and prices, are encouraging the farmers to put in their best efforts with a view of obtaining similar results this year if that be possible. Already Southern vegetables are arriving in the crates, which means a cash business and an introduction into the garden truck districts of a desirable circulating medium. About half a million more cotton bales have come to sight than at the same time last year, and though price is low it means that somebody is buying and somebody getting money.

Omaha.

LEE - CLARKE-ANDRESEN HARDWARE COMPANY.—The poor condition of country roads has tended to decrease farmers' deliveries of produce at country points, and to the same extent has interfered with the trade of retail dealers. Conditions, however, arising from such causes can be of only a temporary nature, and will not have any important bearing on the trade in general. The jobbing trade of Omaha continues to be unusually good for the season, and in almost every line jobbers are talking about an increase in the volume of business over last year, amounting all the way from 20 to 40 per cent. It would be hard to find a period in the history of this section of the country when the feeling was as good among the mercantile community, nor was there ever a time when so few complaints were heard. Business as a rule comes fully up to expectations, and may be said to exceed anticipations. The prospects for business in Omaha during the ensuing season are therefore very encouraging. Real estate is always the last to feel the impulse of a business revival.

The gradual improvement in the city real estate market is an unmistakable index of better times. The large expenditures proposed for public improvements and the extensive preparations for enlarging the already big packing plants of this city afford assurance that Omaha will, during the present year, make another stride forward as an industrial and commercial center.

Cleveland.

THE W. BINGHAM COMPANY.—The business for February was fairly satisfactory, without any very prominent features; but the wet weather and consequent bad roads so far this month have retarded trade, and the volume of business has diminished. Seasonable goods are moving briskly, and many dealers are calling for immediate shipment of orders placed for delivery April 1 and later, while others, who have not covered their wants for warm-weather goods, are ordering. The spring will open with retailers' stocks in good shape. The Wire and Nail market is fairly active and firm, and mills are making reasonably prompt deliveries. The demand for Steel goods in this section is unprecedented, and the factories have more orders than they can fill. Collections are fair and money market easy.

Baltimore.

CARLIN & FULTON.—Since our last letter we can see an improvement in business. Orders are coming in more freely, and we think with favorable weather the reaction in favor of an active trade would be most decided. One great disadvantage under which the agricultural sections labor, particularly at this season of the year, is that of bad roads. It generally happens that after every thaw and heavy rain business in the country is almost suspended on account of the impossibility of locomotion, as the farmer cannot haul his produce to his railroad station for shipment, and it is just as difficult to get from his local store the articles needed for his own use. Perhaps at some time we will appreciate the fact that money spent in establishing and maintaining good roads will prove as beneficial as that spent in fertilizers for the production of a crop. Collections are but fair, and while money is abundant in the large cities, the reverse is the case throughout the South. We think upon the whole the condition of affairs is every day improving and that trade is moving along in a conservative, cautious manner, which is bound eventually to result to the advantage of all.

San Francisco.

HUNTINGTON - HOPKINS COMPANY.—Trade in general is about the same as it has been for the past month, although the pleasant weather of the last few days has improved it somewhat. Competition is keen and prices are being cut very close, especially on staple goods. The local trade in Builders' Hardware is picking up somewhat, and

the indications are that quite a number of elegant homes will be built the coming season. The local cordage factory issued a new card on the 7th inst., advancing Duplex and Sisal Bale Rope $\frac{1}{2}$ cent per pound. The trade are having a Barb Wire meeting to-day, at which the selling price will probably be changed. There is no improvement in the matter of collections, and we do not expect much for some little time to come.

Boston.

BIGELOW & DOWSE.—The retail dealers continue to report a dull trade. In Maine, Vermont and New Hampshire the snow-fall during the whole winter has been unusually light, and from many points come complaint that this has materially affected the lumbering interests. Architects and builders complain of a lack of work, which will affect the sale for Builders' Hardware.

The jobbers are now quite busy supplying the customers' wants for spring goods and on many lines the sales are in advance of past years, and while the retailers complain of a general dullness, the jobbers' sales will bear good comparison with past years. We hear some suggest that the Wire Nails are taking the place of Steel Cut, but our order experience leads us to believe that many customers are going back again to the Cut Nail, and that the sale now is increasing, while the sales for Wire are decreasing. We think this is specially the case in and about the large cities. With wisdom and settled securities all the trade will improve, and there is no reason there should not be as large a sale for Hardware the coming season as ever before.

Portland, Ore.

FOSTER & ROBERTSON.—More seasonable weather than has fallen to our lot for the last two or three weeks could scarcely be asked for. This has given the farmers an opportunity to push their plowing and planting to the utmost, and as a result a very large acreage is being put in.

Trade for the month of February is somewhat ahead of the same month for last year, and very much more than for the same month of 1890, while the prospect for a steady, even business for the entire year has never been more favorable. Prices continue steady, with little in the way of change to report, a decline of $\frac{1}{4}$ ¢ in the price of Barb Wire and slightly lower figures on Sheep Shears being about the only items worthy of note. Collections still continue decidedly slow, with little show for material improvement until after the coming harvest.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—Since our last there was an interruption of trade for a day or two, owing to an unusually severe storm for this season of the year, but it was not of long continuance, and the break in railroad communication was for only a few hours. However, the country roads have been blocked considerably by it and the country dealers complain very much of the slowness of trade and

also of collections, both of which conditions will probably hold good for several weeks to come, as we cannot expect settled spring weather until along in April. Jobbers in all lines, however, have a very fair trade, to which the Hardware trade is no exception. The demand for staple goods has been unusually heavy and the ordinary lines of shelf Hardware are in good demand. No changes in price that are worthy of mention. Our city just now mourns the loss of the senior partner in one of our principal wholesale dry goods houses, who has also been one of our first citizens.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade continues without any material change since last reported. Season goods have been distributed with some degree of activity. The low price upon Barb Wire has induced advanced orders for future shipment. Wire Nails have also come in for a fair share of activity. We presume the consumers of the last named article scarcely realize what competition has done for them in price within the last few years. The trade will remember quite well when this industry was first started in this country, and the argument then presented to those who invested capital was that the protective duty would enable them to compete with the German production. Soon, however, American ingenuity and invention, stimulated by competition, reduced the price below foreign prices, and manufacturers to-day laugh at the duty of 2 cents per pound, when these Nails are sold at the mill at 25 cents less per 100 pounds than the duty alone is, and also sell them at a less price than the foreign product is sold abroad.

Equally interesting is the article on the Glidden Patent Barb Wire, given in *The Iron Age* of March 10, 1892. The first Barb Wire the writer put in stock was the Kelley Patent Barb Wire, for which he paid 10 cents per pound. Now a far superior article of Galvanized Barb Wire is sold to the trade at less than 3 cents per pound, and we are informed by the interior retail merchants that competition compels them to sell it at about $\frac{1}{2}$ cent per pound profit. It will thus be seen at what a low price Barb Wire now reaches the consumer. This small percentage of profit to the retailer is only a further illustration of reduced margins of profits, which have extended from manufacturer to jobber, and from jobber to the retailer.

The country merchant in recent years has far poorer returns for his industry than nine-tenths of all the customers who deal with him. The farmer has his implements at an average of about one-half the value of what they did a very few years ago; his fencing at about one-fourth the value. The mechanic has his tools at about one-half what he paid a few years ago, although the former receives from his farm full price for his products, and the mechanic's wages remain the same, although the cost of living is far less than it was when the established wages per day were first given. But the country merchant arises equally early with the farmer and

mechanic, and during the long wintry evenings remains for hours after the farmer has snugly settled himself for his cozy evening nap, and the same merchant remains for hours after the mechanic has passed his door on his way home from his day's toil; yet the merchant has his money invested at the risk of trade, and only by the utmost frugality, industry and economy can he keep himself financially strong.

Some portions of the South still report that they are at the mercy of the holders of cotton, which, if sold, would distribute the money and make them all financially easy. Holders of cotton, we think, are beginning to realize the fact that an advance this year is quite problematical. No part of the country can be said to be poor with large holdings of the farm products, which now exists through the South; otherwise the Western farmer would be equally poor, owing to the large amount of soil product over previous years. The only difference is, owing to the demand abroad, he has been able to realize high prices for his product, while the South, in this particular season, has not been so fortunate in regard to prices. These matters must settle themselves in the near future with an abundance in hands of those who are not disposed to let it go at the present reduced price.

Notes on Prices.

Cut Nails.—The Cut Nail market shows but little change, being in about the same condition that has characterized it for a month or two, with perhaps a slight tendency toward lower quotations. There is also some unevenness in the prices named by different mills, some of whom are disposed to make concessions more freely than others. Some mills, however, are making an effort to secure better prices. As a general quotation for carload lots at mill \$1.45 may be named, but concessions are made from this figure on desirable orders. Iron and Steel Nails are selling quite generally at the same price, but in some cases a difference of a few cents is made. The regular quotation for small lots from store in New York is \$1.75, and for carload lots on dock \$1.60 to \$1.65 is demanded.

Chicago, by Telegraph.—Steel Cut Nails are selling to a limited extent, as jobbers are not carrying such large stocks of these and hence buy more frequently from the manufacturers, who continue to quote \$1.60 to \$1.65, Chicago, on 30-cent average, while jobbers sell from stock at \$1.70.

Wire Nails.—The Wire Nail market is in substantially the same condition as at our last report, with perhaps a slight falling off in the demand. Prices are well maintained at \$1.75 for carload lots at mill, with slight concessions when necessary. We do not learn, however, of sales having been made at less than \$1.70, and some manufacturers are holding at slight advance on these figures. Less than carload lots from 5 to 10 cents per keg more. Small lots from store are quoted regularly at \$2.

Chicago, by telegraph.—Manufacturers again report a dearth of orders. The

large buyers are well stocked and will not be in the market again until the retail trade can take hold, which may not occur for some little time, as the country roads are in bad condition. There is no inducement for manufacturers to lower their prices, hence they continue to quote about \$1 85, Chicago. Jobbers quote small lots from stock \$1.90 to \$1.95.

Barb Wire—The mills report an excellent demand and the aggregate of orders booked is large. Prices are somewhat uneven and are on a general basis of \$2.65 to \$2.70 for carload lots of Four-Point Galvanized at mill. Some manufacturers, however, refuse to name a lower figure than \$2.75. New York prices for local trade are on a basis of \$3.10 for small lots of Four-Point Galvanized, carload lots being 10 cents less.

Chicago, by Telegraph.—Manufacturers are now in the height of their usual spring rush and are making heavy shipments to the West and Southwest. They are handling most of the carload trade also, which at one time was covered by the jobbers. Carload quotations are \$2.40 to \$2.45 for Painted and \$2.85 to \$2.90 for Galvanized. Small lots are quoted by jobbers at \$2.50 for Painted and \$3 for Galvanized.

Carriage Bolts.—The manufacturers of Carriage Bolts have been conferring with reference to action which should be taken to secure a better regularity in price than has for some time characterized the market, and their deliberations to this end are not yet concluded. The impression prevails that they will be able to reach such an understanding as will put this line of goods in a more satisfactory condition than for some time.

Horse Nails.—The Horse Nail market has for some time been somewhat irregular and slightly lower prices are now ruling. The present range is indicated in the revised quotations of Ausable Horse Nail Company, 4 Warren street, New York, which are given below. This company, who report a considerable increase in the demand for their Nails, are now putting on the market a Nail which they designate as the American, but which will be furnished with any brand which their customers may desire. The company's present quotations are:

	Dis. per cent.
Ausable Horse Nails.....	50
Clinton Horse Nails.....	30 and 10
American are sold at 8 $\frac{1}{4}$ cents per pound for	
Nos. 6, 7, 8, 9 and 10, and 9 $\frac{1}{4}$ cents for	
No. 5.	

The market is referred to as firm at the slightly lower quotations now ruling.

Door Mats.—The Door Mats manufactured by the National Wire Mat Company, Chicago, for whom J. C. McCarty & Co., 97 Chambers street, New York, are agents, are sold from the following list, which is subject to a discount of 40 and 10 per cent.:

No. 2, Size 16 x 24.....	\$1.50
" 3, " 18 x 30.....	2.00
" 4, " 22 x 36.....	3.00
" 5, " 26 x 48.....	4.50
" 6, " 30 x 48.....	5.25
" 7, " 36 x 48.....	6.50
" 8, " 36 x 60.....	8.00
" 9, " 36 x 72.....	10.00

The Flexible and Rigid Mats are sold from the above list at the discount named and the Brass Mats are sold from the above list doubled, subject to the same discount.

Magie Oscillating Curry Comb.—This article, which is manufactured by F. E. Kohler & Co., Canton, Ohio, for whom J. C. McCarty & Co. are agents, 97 Chambers street, New York, is made in two patterns:

Style A, arranged to be held by thumb and little finger, is quoted at \$1.75 per dozen and \$20 per gross.
Style B, with regular handle, is quoted at \$2 per dozen and \$22 per gross.

Glass.—The local Glass market shows no indications of stronger prices, as American Glass is being sold down to 80 and 20 per cent. discount, and imported Glass is bringing from 80 to 80 and 10 per cent. discount. From stock cards received by jobbers from factories, the indications are that stocks are accumulating in manufacturers' hands. Notwithstanding the apparent absence of demand, there is doubtless quite a movement of Glass into strong hands, as it is intimated that large jobbers have made contracts with factories at low prices, with the intention of realizing a handsome profit when an advance takes place. The nearer the time approaches when the factories go out of blast, the better prospect there is of an advance in price. There is but two months and a half left, if the factories go out of blast June 1. Or they may run until July 1, with the idea of not starting up until late in the fall, say October 1. It requires fully one month after getting in blast before new Glass can be put on the market. Of course it is problematical just when the factories will shut down, and when they will resume work; but unless the demand justifies such a course, it is not probable that they will run up to July 1 and start up again September 1. After the furnaces are once out of blast and production consequently ceases, it does not take a very long time for the regular fall demand to break the assortment in stocks and for prices to stiffen. The number of pots in operation, as shown by Pittsburgh reports, covering the Eastern, Western and Northern districts, is an increase of 36 since reference was last made to this matter in our columns. Quotations remain unchanged, as follows: American Window Glass, 1000-box lots or more, 80, 10 and 5 per cent. discount; carloads, 80 and 10 per cent. discount; less than carloads, 80 and 5 per cent. discount; French Window Glass, 75 and 10 per cent. discount; American Plate is held at a discount of 50, 10 and 5 per cent., and imported Plate at a discount of 60 per cent.

THE WESTERN TUBE COMPANY, Duluth, Minn., have been purchased by Rogers & Ordway, a well-known Hardware firm in the Northwest. It is the intention of the new owners to increase the present capacity of the house and to add mill and mining supplies. The business of the company will be under the management of W. H. Blades, who recently resigned the management of the Chapin-Wells Hardware Company in view of this appointment.

Hardware Organization in New York.

WE TAKE PLEASURE in announcing that the project of having a Hardware organization which shall represent the trade centering in New York City is taking definite shape, and something is to be done in this direction without delay. We give below the text of an invitation which is extended to merchants and manufacturers in Hardware and related lines by Webster R. Walkley, Chairman of the Committee of Arrangements, and who presided at the late dinner:

NEW YORK, March 15, 1892.

DEAR SIR: At a late dinner of the Hardware and Metal trades it was the express wish of many present that, at an early day, a meeting should be called to discuss the advisability of forming a

HARDWARE CLUB OR ASSOCIATION.

In accordance with such desire you are requested to meet other members of the trade in the parlors of the Cosmopolitan Hotel, corner of Chambers street and West Broadway, on Saturday next, March 19th, at 2.30 P. M.

Please extend this information to others interested in the matter.

Yours truly,

W. R. WALKLEY,

Chairman of Committee of Arrangements.

It is hoped that at the meeting next Saturday there will be a good representation of the trade, so as to give careful attention to this important matter and to secure such action as will result in the formation of a Hardware club, association or organization of some kind on a permanent and successful basis.

Trade in Denver.

FROM A WELL-KNOWN Hardware house we are in receipt of the following advices in regard to the condition of trade in Denver, in which special reference is made to the growing importance of that city as a Hardware center:

The conditions of business in Denver have materially improved in the past 60 days and the prospects for the spring and summer are encouraging. Money is in good supply for legitimate enterprise and collections are much better than in the latter months of 1891.

The architects have been busily employed during the winter in the preparation of plans for public and private buildings of a better and more costly style than perhaps in any previous season—less in numbers, but of a higher average value.

The mining interests of Colorado, which are all tributary to Denver, have received a strong impetus in the discovery and development of the new camps of Creede and Cripple Creek. Large demands have been made upon this market for supplies, notably of lumber, Hardware and provisions. The larger camp of Creede is located 310 miles from Denver in a south-westerly direction, and can be reached in a Pullman car via the Denver and Rio Grande Railroad, a branch having been

built from the main line at Alamosa direct to the camp. This is a novel feature in the history of new mining camps; the old routes were via mules and stage over weary miles of rocks and mountains, but Colorado is a progressive State, and only the most modern appliances of steam and electricity are considered suitable for the development of the wilds of Willow Creek.

Our Foreign Representative.

A CABLEGRAM has been received from one of Polhemus Lyon's party announcing their arrival at Melbourne on the 11th inst. and also conveying the information, which will be received with regret, that Mr. Lyon has typhoid fever. He is, however, reported to be convalescent and doing well.

Fires in Cleveland.

ON THE MORNING of the 12th a fire broke out in the works of the Cleveland Barb Fence Company, Cleveland, Ohio. The large quantities of benzine in the building rendered the flames quite formidable for a time. All the wood work of the north end of the building was consumed, while the upright portion of the structure remained practically untouched. The loss was \$2000.

On the same morning the works of the Colwell & Collins Norway Bolt Company, also of Cleveland, were destroyed by fire. The fire spread with such rapidity that those who were in and about the building at the time cannot say how it originated. The amount of the loss will depend in large measure on the condition of the contents of the building after the wreck has been cleared away. It is thought not unlikely that the loss will foot up \$75,000.

Trade Items.

THE TABB & JENKINS HARDWARE COMPANY, Baltimore, have been chartered by special act of the General Assembly of Maryland, for the purpose of carrying on a general Hardware business in that State and elsewhere. The capital stock consists of \$125,000, divided into 1250 shares of \$100 each, with power to increase same to \$250,000. The principal office of the company is to be located in Baltimore, their present location being 107 Hopkins place. The officers and directors for the first year are Martin Lane, J. Lloyd Tabb, Wm. H. Berrey, C. Taylor Jenkins, J. Prosser Tabb, Wm. M. Locke, John H. Wight and Wm. C. Dimmock. These gentlemen were formerly of the wholesale Hardware firms of Martin Lane & Co., Tabb Bros. & Dimmock and Berrey, Jenkins & Co., with the exception of John H. Wight, who is secretary and treasurer of the Sherwood Distilling Company, and still retains active management of it. The company succeed the above firms, and by this consolidation expect to secure considerable reduction in expenses, thereby enabling them to sell at closer figures to their extensive trade in Maryland, Virginia, West Virginia, Pennsylvania, the South and Southwest. The company are regarded as entering the field under favorable auspices, and will have the best wishes of the trade for their success.

CHICAGO COUNCIL No. 30, United Commercial Travelers of America, gave a

banquet in that city at the Palmer House, on Saturday evening, March 5. A. J. Dowd, Past Grand Counselor, was toastmaster. The toasts and the parties responding to them were as follows: "The Order of United Commercial Travelers, Its Mission and Its Work," W. A. Johnson, Supreme Junior Counselor, Cincinnati, Ohio; "Our Commercial Traveler, the Man of To-day," S. A. Haines, Supreme Chaplain, New York; "The Ladies, What Would We Be Without Them?" C. J. Mann, Senior Counselor, Lima (Ohio) Council, No. 17; "The Sample Case, the Pen is Mightier Than the Sword," C. B. Flagg, Supreme Secretary, Columbus, Ohio; "Chicago Council, No. 30; Last but Not Least," J. J. Flinn, Chicago.

THE NORTHFIELD KNIFE COMPANY, Northfield, Conn., have recently purchased the factories and entire plant of the late American Knife Company, Thomaston, Conn., together with all the real estate, water and steam power and 32 dwellings. The company's facilities will thus be largely increased, making this plant one of the largest in the country for the manufacture of Pocket Cutlery.

WE ARE ADVISED that C. F. Warner has purchased an interest in the Buffalo Hammer Company, Buffalo, N. Y., and has assumed the active management of the business. The company's facilities have been largely increased, thus enabling them to execute orders promptly with a class of goods the quality of which is referred to.

LORAIN MFG. COMPANY, Cleveland, Ohio, announce that Henry C. Rouse has resigned the office of vice-president and treasurer of the company to engage in other business. B. L. Rouse is now vice-president and general manager, and E. M. Smith secretary and treasurer.

N. PURDUM & Co., Chillicothe, Ohio, dealers in Hardware, Implements, &c., are contemplating removing to a new location. The store in view is about 90 feet long by 22 feet wide, with an elevator in the rear and stairs leading to cellar and second floor. They desire suggestions and plans covering the best ideas for fitting up such a Hardware establishment. They will put shelving on one side and perhaps on both sides of the store.

R. H. DANA & Co., 25 Beaver street, New York, have been appointed agents for New York and the export trade for the sale of the Rex Lawn Mowers, manufactured by W. E. Lape, Syracuse, N. Y.

J. L. BIEDER of the Cleveland Novelty Company, Cleveland, Ohio, has recently commenced proceedings on account of infringement of his patents, which cover the adjustable feature of Grass Catchers which they have put on the market under the name of Bieder Adjustable Grass Catcher. The company advise us that they stand ready to protect their rights in the matter.

UNDER DATE March 12, it is announced that Bradford Kennedy & Sons have assumed the business formerly conducted by Kennedy, Spaulding & Co., wholesale Hardware, Metals, Sheet and Bar Iron, Nails, Railroad and Contractors' Supplies, &c., Syracuse, N. Y. The new firm ask a continuance of the many favors bestowed on the old. The concern was founded by Bradford Kennedy in 1859. Two years afterward D. M. Kennedy was admitted, the firm name being Kennedy Brothers. In 1862 R. R. Spaulding was admitted to the firm and the style was changed to Kennedy, Spaulding & Co. This partnership was maintained until 1883, when D. M. Kennedy retired and Geo. H. Kennedy, a son of Bradford Kennedy, was taken in as junior partner, the firm name remaining unchanged. Bradford Kennedy has now

taken charge, with his sons, Geo. H. and Harry L. Kennedy, and they announce that they will endeavor to sustain the reputation of the house.

THE TRADE WILL OBSERVE the advertisement of Judson L. Thomson Mfg. Company, Waltham, Mass., in which they illustrate their Bifurcated or Slotted Rivets. They also show the convenient and attractive form in which they are put up.

ELSEWHERE IN THIS ISSUE will be observed an announcement by Haydock & Bissell, 12 Murray street and 15 Park place, relating to trade sales of Agate Ware, Granite Ware and Hardware. On Tuesday and Wednesday, March 22 and 23, a complete assortment of Agate Ware and Granite Ware seconds will be offered for sale by order of the Lalance & Grosjean Mfg. Company and St. Louis Stamping Company. A large line of Stamped Tinned Ware, Blue and White Ware, Tea, Table and Basting Spoons, Fry Pans, Refrigerators, &c., will also be disposed of. Thursday, March 24, will be occupied with a large and peremptory sale of Hardware, Edge Tools, Axes, Hatchets, Hammers, Measuring Tapes, Coil and Halter Chain, Coffee Mills, Scythe Stones, Cast Steel Shovels, Hay and Manure Forks, Strapped and Plain Ferrules, &c.

CHADBORN & COLDWELL MFG. COMPANY, Newburg, N. Y., under date 14th inst., announce to the New England trade that they have established a branch office and salesroom in Boston at 49 South Market street, for the purpose of more promptly supplying the increasing demand for their Mowers in that section. The company will carry at that point a full supply of the various Lawn Mowers they are manufacturing, and assure the trade that orders will receive careful and prompt attention. The branch office will be in charge of G. F. Chadborn.

J. H. BENNETT & Co., Pueblo, Col., have sold their stock of Hardware to the Greenleaf Francis Hardware Company, who are their successors and will continue the business at the old stand. The officers of the new corporation are: Geo. F. Greenleaf, president; J. H. Bennett, vice-president, and H. R. Francis, secretary and treasurer. Mr. Greenleaf has been with Hibbard, Spencer, Bartlett & Co. of Chicago for the past 13 years.

PEERLESS MFG. COMPANY, Louisville, Ky., announce under date March 1 that they have purchased of the E. T. Harris Company of Chicago that department of their business pertaining to Fire-Place Furniture and are now moving the stock and patterns to their works in Louisville. They are now furnishing goods in these patterns. A price-list will shortly be issued covering their former goods and the goods thus purchased. In the meantime all special quotations not in accordance with the regular discount ruling are withdrawn.

OTTO KREBS, Importer of Hardware, Cutlery and Tools, has removed from No. 512 Commerce street, Philadelphia, to the N. E. corner of Fifth and Commerce streets, where he has greatly improved his business facilities with enlarged premises and a considerable increase of stock. Mr. Krebs imports German Hardware exclusively, the greater part manufactured in his own factory in Germany. He is also sole agent in the United States for C. D. Schaff of Solingen, Germany, manufacturer of Hardware.

THE ADVERTISEMENT of the Auburn Mfg. Company, Auburn, N. Y., will be of interest, announcing, as it does, that the stockholders of the company have decided to offer their manufacturing plant and machinery for sale. A view of the works is given, showing that the buildings surround

a hollow square several acres in extent. The plant is located on the line of the New York Central Railroad and is but a few rods distant from the Lehigh Valley Railroad, thus affording excellent shipping facilities. Other particulars of interest are given in the advertisement.

HOLLEY, MASON, MARKS & Co., 209 and 213 Howard street, Spokane, Wash., have had photographic views of the interior and exterior of their wholesale and retail Hardware establishment grouped in an attractive manner, and framed. Four views are given, the first showing the building fronting on Howard street. This is an imposing structure, six stories in height, well lighted by large windows. The view of the main floor shows a large and well-assorted stock, covering a large line of goods, and having such modern appliances as traveling ladders, cash carriers, &c. Views are shown of two of the offices, one being that of the general manager and buyer and the other of the general offices. The appointment and arrangement of the store indicate enterprise together with a thorough familiarity with the business needs of a first-class Hardware establishment.

THOMAS A. LAMOTTE of Philadelphia, manufacturer of specialties in Hardware, Metal and Leather, who has for the past two years been in temporary quarters at 11 North Fourth street, Philadelphia, where he removed after the destruction by fire of his former premises in Commerce street, has now made arrangements for removal to 507 Market street, which he is fitting up for a salesroom and office, and hopes to open there on or before April 1. With ample room and better facilities for shelving goods, and in a most advantageous situation he expects to greatly increase his business, and continue to receive the same support which his customers have extended to him for the past 13 years.

THE OFFICES of the Braddock Wire Company, manufacturers of Plain and Barbed Wire and Wire Nails, have been removed from the Lewis Block, Pittsburgh, Pa., to fifth floor, Westinghouse Building, in that city. Through the courtesy of Wallace H. Rowe, secretary of the company, a representative of *The Iron Age* inspected the new offices recently. They have been specially fitted up to meet the needs of the firm, and in point of convenience and furnishing are as fine a suite of offices as can be found in Pittsburgh. The Braddock Wire Company extend a cordial invitation to their friends and the trade generally to call on them in their new quarters.

THE BARBEE WIRE AND IRON WORKS, whose main office and warehouse are in Chicago, have but recently completed and occupied their new factory at Lafayette, Ind. The building, erected specially for their purposes, is 136 feet square and four stories high. Natural gas is exclusively used for fuel and lighting. Their daily consumption for heating buildings, light and raising steam is about 10,000 feet, which costs them but 7 cents per thousand. They manufacture fencing, stable fittings, calf weaners, office railing, waste baskets, department correspondent baskets and office specialties. They began last season the manufacture of the Hoosier lawn mower in five sizes. The works are well employed in all departments, the force numbering some 140 hands.

TAYLOR BROS. COMPANY, Rochester, N. Y.: 1892 catalogue of Thermometers, Barometers, Hydrometers, &c., manufactured and imported by the company. The catalogue is neatly and attractively gotten up and satisfactorily represents the goods.

The company state that a comparison of this catalogue with the one issued in 1889 will reveal many changes. Where numbers have been dropped from the old list it has been for the purpose of substituting other and more desirable patterns. Such changes are especially notable under the head of House or Cabinet Thermometers. The many additions to their present list of Standard Grade Thermometers is only in keeping with the increased demand for instruments of precision.

Business Principles.

FROM A HARDWAREMAN of experience and recognized position we have the following admirable suggestions in regard to the principles which should be observed in connection with the purchase of goods. While the right is conceded to buy at as advantageous terms as possible, attention is called to certain unbusinesslike practices which sometimes are encountered in the trade. We take especial pleasure in laying before our readers these excellent maxims:

The tradesman who expects to win success must study carefully the economies, look carefully after purchases, try by every honorable means to get the lowest prices the market affords. No manufacturer or wholesale dealer will care less for you orders, or have less respect for you, if you try to buy at the very bottom price. Secure any and every advantage you can in low freights, in time or in cash discount. Carefully look over invoices and insist that prices and terms are in every respect as agreed.

On the other hand be just as careful not to exact a cent that does not belong to you. If you find, after making a purchase at an agreed price, that you could have done better, it is quite right to call the attention of your correspondent to this fact. You have no right, however, to make the deduction without the consent of the other party.

Be very sure you are right in making claims for shortages. Some careless clerk may have mislaid a package.

Do not take a cash discount from a bill after the agreed time.

When your bills are due, if for any reason you cannot meet them, write plainly to your creditor explaining reason for delay.

Always answer requests for money when bills are due.

Never return goods without previously writing to the shipper. If the mistake has been his in sending them, he cannot refuse to take them back. If you have made an error in ordering something you cannot sell, you can doubtless in most cases arrange for return and credit or exchange, but you should have instructions from the seller before returning.

Most wholesale Hardware houses and manufacturers make a charge for package and cartage, and do not include this item

in their expense account. Unless you have a specific agreement that this item should not be charged you have no more right to deduct it from your invoice than any other item.

The dealer who makes unreasonable claims, returns goods without reason, exacts terms and makes deductions in settlement that he is not entitled to, is "penny wise and pound foolish." He not only inflicts loss upon his business correspondents, but he injures himself. The fact of his making these unreasonable exactions is soon known to the trade, and however strong he may be, financially, there is less desire to sell him goods. He cannot go into the market on equal terms with his neighbor, who, perhaps, has no more money, but who lives up carefully to his agreements and asks for nothing he is not fully entitled to.

J. C. McCarty & Co.

J. C. McCARTY & CO., 97 Chambers street, New York, have recently been appointed agents for Reed & Prince, manufacturers of Rivets, Burrs, Stove Bolts, &c., Worcester, Mass.

They have also been appointed agents for National Wire Mat Company, Chicago, manufacturers of the National Rigid Frame Door Mat and the Perfect Flexible Door Mat. The company also make these goods in brass. The prices at which they are sold to the trade are referred to in another column.

J. C. McCarty & Co. have also obtained the agency for the Magic Oscillating Curry Comb, manufactured by F. E. Kohler & Co., Canton, Ohio. The prices of these goods are also referred to in another column.

Net Prices.

A HARDWAREMAN of some experience refers in the following emphatic terms to the effort made by some in the direction of a more general use of net prices, expressing his decided preference for the present system:

If among the Hardware dealers who sell goods at retail there is one who favors the abolishing of all standard lists and the substitution thereof of net prices, I would say to him, "Try it," being sure of converting him by that method in one month or less. The use of net prices in selling is with us in this country compulsory, so we are well acquainted with the extra work this means for changing and correcting prices alone. To illustrate, we will take Wood Screws. Of this article a fair assortment comprises, say, 50 sizes. Upon receipt of a consignment we are forced to calculate the cost of each size, as the duties are paid by weight, and it would not do to make the $\frac{1}{2}$ x 2 inch Screws pay the duty proportional to 4 inches by No. 24. This necessitates the change of every single price on a list made for the purpose, often requiring half an hour's work, whereas the New York Hardwareman changes his discount for all sizes in half a minute. The same fact applies to all kinds of Bolts, to Tacks, Files and other like articles. Therefore, to cure a net-price advocate, let him try his own medicine for a while, applied to selling alone, let alone buying.

CYCLES.

(Continued from page 479, March 10.)

WILLIAM READ & SONS, 107 Washington street, Boston, and Chicopee, Mass., are offering their New Mail Safeties for 1892 in two grades. One machine is described as having cushion tires, tangent spokes, drop forgings throughout, strictly interchangeable parts, all ball bearings, low handle bars, Garford saddle well back, the easy cushion tires taking the place of a spring fork. Pneumatic tires are furnished on this wheel if desired. The other machine is referred to as having spring fork and band brake, drop forgings, interchangeable parts throughout, cushion or pneumatic tires. The New Mail Ladies' Safety is made with Crendenda tubing, all ball bearings, cushion tires, wound and tied tangent spokes, low handle bars, dress guards and Garford's ladies' saddle. They also show the Chicopee, a boys' Safety, the Little Giant, a boys' Safety with spring fork, and girls' Tricycles.

THE STOVER BICYCLE MFG COMPANY, Freeport, Ill., are building two machines this season, one a 34-pound light roadster, with cushion or pneumatic tires, called the Thoroughbred Phoenix; the other, a very light machine for ladies' use, known as the ladies' Phoenix. They have improved their last year's line of machines in various ways, and are still building their standard machine, the Paragon, as the leader. They remark that they are thorough believers in the spring frames and cushion tires, which are used on the Paragon and ladies' Paragon. They also build the Iroquois, a convertible machine, weighing about 48 pounds, on which they supply solid, cushion or pneumatic tires, as desired. The manufacturers state in regard to material and workmanship, that the finest material and the best workmanship are none too good for them, and that their wheels are guaranteed in every particular.

THE EAGLE BICYCLE MFG. COMPANY, Torrington, Conn., will make no change in their Eagle high machine for the coming season, except that the light roadster will be fitted with pneumatic tire in addition to their 1½ cushion tire. For their new line this year they are putting on the market an Eagle Chain Safety, an illustration of which was recently given in *The Iron Age*. The styles in this machine are the pneumatic road wheel, weighing 44 pounds; the Eagle Scorchers, weighing 37 pounds, and the cushion tire Eagle. They state that their 1½ cushion tires as used on the safety are made of the purest rubber gum, and that they are equal in life and elasticity to many of the pneumatics at present on the market. Their machines are put on the market through small agencies, and also through general agencies, to which larger territory is given.

HIBBARD, SPENCER, BARTLETT & Co., Chicago, Ill., have accepted the agency for the United States of the Belsize and Irwell Cycles, which are English machines. The Belsize is referred to as a machine for those who want the best of everything in manufacture and design. It is fitted with Dunlop pneumatic tires, geared to 60 inches, and weighs 45 pounds all on, including saddle bag, or 38 pounds when stripped. The Irwell is made in two grades, Nos. 1 and 4; also in a ladies' Safety, and in a combination Safety. They are agents for the West for Featherstone's Road King and Road Queen, also for the New Mail improved for 1892. Two new machines are shown in their bicycle catalogue, the Queen Mab, a young ladies' Safety, and the Blizzard, a boys' 24-inch

diamond-frame Safety. The additional wheels illustrated are the Oxford; Courier improved for 1892; Gypsy ladies' safety; Tornado; Cricket; Wanderer and Little Jewel. The new Crippler and new Lever Tricycles are also illustrated, together with a Fast Mail steel Velocipede. The company sell the machines wholesale only, and they have a line sufficiently extensive to handle more than one dealer in a town, giving exclusive agencies on special goods, should that be deemed desirable. A full line of Bicycle accessories are offered in connection with the machines.

WESTERN WHEEL WORKS, Chicago, Ill., are showing a large line of wheels, including various grades and styles. A description accompanies each machine, in which the parts are treated in detail. There is also a table of the component parts of each machine, with illustrations of each part, and the price of each. The machines as illustrated are as follows: Blawhawk; Crescent No. 2; Escort; Crescent No. 1; Juno; Rob Roy Nos. 3, 2 and 1; Cinch; Combination Junior; Boy's Junior; Pet; Improved Lever Tricycle and Improved Velocipedes. This line represents machines from a high grade pneumatic-tire wheel down to a 20-inch Cycle made especially for children.

SCHOVERLING, DALY & GALES, 302 Broadway, New York, are agents for Humber Cycles, Gales' Safeties, Gazelle boys' and girls' Safeties. Their 1892 catalogue of Bicycles and sundries shows Humber Light Roadster Safety No. 1, Humber No. 5 Track Racer, Humber No. 5 Road Racer, Humber American Roadster No. 16, Humber Ladies' Safety No. 8, new pattern for 1892, Gales' Diamond Model A, Gales' Ladies' Model B, Gales' Diamond Safety, Model '91, Gales' Ladies' Convertible, Gales' Safety, Model '90, Gotham Safety Nos. 1 and 2, Gazelle Safety Nos. 4, 2, 5 and 6, Queen City Tricycle and Velocipede. The Gales' Diamond Model A is a new high-grade machine made in this country, in which are combined some novel features. The Dunlop '92 pneumatic tire will be used on wheels fitted with pneumatic tires. The catalogue contains illustrations and prices of Bicycle sundries, also of Powell & Hanmer's Lanterns, for which the above firm are agents.

GENDRON IRON WHEEL COMPANY, Toledo, Ohio, and 107 Chambers street, New York, show for 1892 a line of Gendron Bicycles, known as Nos. 1, 2 and 7. The No. 1 is referred to as an exceptionally high-grade juvenile, the material being the best quality that is used for Cycle making, and its workmanship and finish as being of the best. The No. 2 is designed for misses and ladies; a cross bar being furnished with each machine, by the use of which it may be converted into a youth's wheel. The No. 7 wheel is made with cushion or pneumatic tire, and is referred to as a new wheel designed on the latest and most approved lines, with long head and well extended wheel base. They add that in this machine they produce a light yet most rigid frame work; that they do not use exceedingly light gauge tubing, nor have they reduced their forgings to a dangerous size for the sake of weight; that the machine weighs 45 pounds, but that strength is nowhere sacrificed for lightness. They state that while this machine is equal in every respect to the highest priced wheel on the market, yet with their facilities for making and marketing them, they are able to price it at a medium figure.

H. A. LOZIER & Co., Cleveland, Ohio, who control the entire output of the Lozier Mfg. Company, are in the market with their Cleveland Safeties Nos. 1 and 2; the Giant No. 4; the Giantess No. 3 and the Little Giant. The No. 1 Cleve-

land is referred to as a new, thoroughbred, high-grade roadster, capable of carrying any weight over any sort of road, constructed only of steel and exceptionally handsome in finish. The No. 2 Cleveland is also new, and will be ready for delivery about April 1. The manufacturers state that it will be one of the lightest Bicycles ever produced for road use, and that it will be fitted with their own patent pneumatic tire or cushions, as may be desired. The Giant Safeties have had changes made in the construction of minor parts, all of which, it is stated, have been improved and strengthened wherever opportunity presents itself; and from the rear fork of the Giantess has been taken the Bolte spring, so that the machine is now made with a stiff rear fork. The No. 4 is fitted with 1½-inch cushion tire to the rear wheel and an inch cushion to the front. The Giantess has cushions to both wheels. The Little Giant is a juvenile machine, made with both plain and ball bearings.

THE CHAPMAN HARDWARE CO., Toledo, Ohio, in advance sheets, illustrate the lines of wheels which they will handle for the season of 1892. These are described as 1892 Black Hawk, a high grade machine with pneumatic tire; 1892 Crescent No. 2, same as No. 1, excepting the size of the tires, which are 1½-inch cushion, and the spokes, which are tangent; 1892 Crescent No. 1, the wheels are better than the '91 pattern, furnished with cushion tires at a reduced price; 1892 Juno, a ladies' Safety, improved over the 1891 pattern; 1892 Escort, similar to the Juno, but has larger wheels and nickel-plated brace rod; Rob Roys Nos. 1, 2 and 3, with solid and cushion tires, ball bearings, &c.; 1892 Lightning, a 24-inch wheel Safety, 1892 Combination Junior, 1892 Boys' Junior and 1892 Pet Safety.

BROWN BROS. MFG. COMPANY, Chicago, Ill., advise us that the Greyhound model for 1892 is built on purely diamond lines, long frame, central upright brace tube, 10-inch ball head, balls around, including pedals; gas and charcoal brazed. The wheels are 30 inches in diameter, with patent hollow or solid rims of cold roll steel; 1½-inch best quality cushion or 2 inch pneumatic tires. The hubs have a steel straight flange, with bushings for the ball race of hardened silver steel. The machine is finished with a high grade enamel and nickel plate, the latter on copper. The novel features of the Greyhound Safety are referred to as being long and rakish lines; hub with detachable chain wheel; Brown Bros. "Nonrattling" brake of the brake spoon construction. The weight of the machine is about 40 pounds, which the manufacturers think as light as necessary for an all-round wheel.

SINGER & Co., Coventry, England, and 6 and 8 Berkeley street, Boston, are offering for 1892 the Singer Safeties as follows: The Miniature, Miniature Ladies', Special Apollo, Royal Singer, Apollo, Singer, Singer Military Safety, Intermediate, Ladies' Singer, Special Singer, and the Singer Modele du Luxe. They also show the Miniature, Special S. S. S. and Singer Straight-Steerer No. 3 Tricycles. They make one ordinary called the Apollo Bicycle; also the Singer Carrier, for parcel delivery, and the Velociman, a tricycle operated by hand for the use of those who are deprived of the use of their legs. They call attention to the Singer wired cushion tire, which is described as being made of the very best soft rubber 1½ inches in diameter, the chief object of having a hole through it is to admit of its being fixed, without stretching, in the rim, by means of a wire instead of using cement for fixing the tire. The improvements which have been adopted for 1892 by Singer & Co., are as follows:

Wired cushion tire, ball steering, annular cone steering, steering lock and detachable crank bracket.

GORMULLY & JEFFERY MFG. COMPANY, Chicago, Ill., are putting two new machines on the market for 1892, the Diamond Rambler No. 2 and the Boy's Ideal Rambler. All their machines have been improved wherever possible, which has been principally in minor details. In their opinion the greatest step and change in Cycle trade has been in the tires, and referring to the growing demand for the pneumatic tire, they remark: "Until last year the solid tire prevailed almost entirely; last year the cushion tire superseded the former, and this year the cushion, together with the inflated cushion and the pneumatic tires, are in the ascendancy, the pneumatic being a little in advance of the others, and the prophecy is that this will be a 'pneumatic year.'"

The G. & J. pneumatic tire is described as having the tube molded endless, and as provided on its tread portion with a series of ridges or corrugations, which afford a substantial wearing surface and effectually prevent side slipping on wet roads. The machines which they will make this year are the American Diamond Rambler No. 1, made with three styles of tires, 1½ inch cushion, 1½-inch inflated cushion and 2 inch G. & J. pneumatic tires; American Diamond Rambler No. 2, American Ladies' Rambler, American Combination Rambler, Boys' Ideal Rambler, Girls' Ideal Rambler and American Light Champion. With all the machines fitted with pneumatic or inflated cushion tires one of their improved pumps will be supplied.

Price-Lists, Circulars, &c.

SICKELS, SWEET & LYON, 35 Barclay street and 40 Park place, New York: Hardware, Cutlery, Farm and Garden Tools. Their catalogue No. 3, for spring, 1892, contains 88 pages, fully illustrated, together with description and list prices of season goods and standard Hardware. The goods shown are Grass Hooks, Hedge and Grass Shears, Auburn Mfg. Company's Steel Goods, Lawn Mowers, Grub Hoes, Mattocks and Picks, Hammers and Sledges, Freezers, Oil Cans, Hair Curlers, Lemon Squeezers, Pearl, Agate and Granite Ware, Brushes, Screen, Window and Door Frames, Spring Hinges, Clothes Wringers, &c. In addition to the large line of goods made especially for them, for which they are New York agents, they sell at manufacturers' prices the various productions of a large number of manufacturers. An alphabetical index is given on the last pages, the catalogue being a well-arranged and convenient one.

PORT CHESTER BOLT AND NUT COMPANY, Port Chester, N. Y.: Catalogue for 1892. The various lists of Bolts, Nuts, &c., are thus given in a convenient and accessible form. The company announce that they are now prepared to do special work in cold punching, such as Chain Links, Round Collars, Cotton Machinery Sturups, Levers, &c.

THE JAS. L. HAVEN COMPANY, Cincinnati, Ohio: Sorgo and Sugar Cane Mills, Elevators, Malleable Castings, Pump Chain, Clevises, Ox Shoes, Shutter Hinges, Axle Pulleys, Boiler Handles, Tire Drills and Benders, Grindstone Fixtures, Cutting Boxes, Cider Mills, &c. A list of these goods is given, with an invitation to write for prices.

H. A. WILLIAMS MFG. COMPANY, Boston and New York: Oilers, Lamps and Brass Specialties. Their 1892 catalogue contains illustrations and prices of Oilers, Engineers' Fillers, Steel Tallow Pots, Steel Railroad Oilers, Inspectors' and Loco-

motive Torches, Pump Oilers, Steel Jacket Lamps, Awls, Nozzles, Water Filters, &c. The manufacturers state that by the removal of their Taunton, East Cambridge and Lowell manufactories to their new building, 334 Congress street, Boston, they have concentrated and largely increased their facilities.

BUHL, SONS & Co., Detroit, Mich.: Price current, March 5, 1892. In it Oil Cans, Milk Cans and Trimmings, Dairy Supplies, Sprinklers, Hose Reels, Washing Machines, Ice-Cream Freezers, Refrigerators, Ice Pits and Tongs, Vises, Hangers, Wheelbarrows, Spades, Shears, Bird Cages, &c., are given place.

C. W. LECOUNT, South Norwalk, Conn.: Price-list of Machinists' Tools. This is a 16-page pamphlet, and represents LeCount's Patent Clamp Dog, Steel Clamp Dog, Extra-Heavy Steel Boiler Clamp, Steel Dog Wrench, Light Steel Boiler Clamp, Amateurs' Dog, Straight-Tail Dog, Standard Wrench, Patent Bolt Dog, Saw Mandrel, Expanding Mandrel, Light Steel Dog, Patent Malleable Iron Lathe Dog, Heavy Steel Dog, Steel Chuck Drill Holders, new Vise Clamp, &c.

TERRE HAUTE SHOVEL AND TOOL COMPANY, Terre Haute, Ind.: Catalogue, season 1891-1892. The company's line of Forks, Rakes, Hoes, Hooks, Shovels, Spades and Scoops and Draining Tools are illustrated in a handsome pamphlet comprising 43 pages. The company call attention to the full line they manufacture and the completeness of their works. The convenience of their location is also mentioned, and the special care with which their goods are turned out.

L. W. FERDINAND & Co., Boston, Mass.: Circular relating to Jeffrey's Patent Marine Glue, for which they are agents. Directions are given for melting and applying the Glue for the various purposes for which it is intended.

MEADVILLE VISE COMPANY, Meadville, Pa.: Catalogue showing the varied line of Vises which they are making, together with the Flexible Light Holder, Barrett Machine Cork Puller, Barrett Improved Cylinder-Boring Machine, Always Ready Cheese Cutter, Rounding, Pened and Fitting Hammers, Electric Cork Puller, Excelsior Bolt Clipper, Champion Bolt Clipper, McNair's Adjustable Pipe Wrench, Nippers, &c.

BUTLER HARDWARE COMPANY, 23 Warren street, New York: Discount sheet No. B, applying to 1891 catalogue. Prices are thus given on the line of Builders' Hardware manufactured and dealt in by the company.

RECTOR & WILHELMY COMPANY, Omaha, Neb.: Price current, February, 1892, illustrating Rakes, Forks, Handles, Scythe Stones, Cradles, Grass Hooks, Post-Hole Augers and Diggers, Solid Steel Spades and Shovels, Wagon Hardware, Malleable Iron Clevises, Brushes, Curry Combs, Picture Nails, Molding Hooks, &c.

SIDNEY SHEPARD & Co., Buffalo, N. Y.: Circular of seasonable goods. Illustrations are given of Improved Creamery Pails, Milk Cans, Fly Traps, Refrigerators and Ice Chests, Water Coolers, Bathtubs, Foot Baths, Toilet Ware, Spun Copper Tea Kettles, Eaves Trough Fasteners, Rain Water Cut-Offs, Bird Cages, Sifters, Mincing Knives, &c. A circular is also issued relating to the Lightning Ice Cream Freezer.

CINCINNATI CORRUGATING COMPANY, Piqua, Ohio: Illustrated catalogue for 1892. The well-known line of Corrugated Roofing, Siding, Ceiling, Arches, Lath, Shutters and Doors, V-Crimp Iron Roofing, Standing Seam Plain Roofing, Roll and Cap Steel Roofing, Ridge Capping, &c., manufactured by this company is illus-

trated and described. In the early part of the catalogue the company call attention to their splendid facilities at Piqua, where their rolling mills are operated by natural gas. They also state that they have doubled the capacity of their galvanizing works during the past year. They also issue a price-list applying to the catalogue, as well as separate circulars relating to Shingles, patent edge Corrugated Iron, instructions how to order Roofing, Siding, &c., and "The Life of an Iron Roof."

BLISH, MIZE & SILLIMAN HARDWARE COMPANY, Atchison, Kan.: Spring catalogue, 1892. In this way prominent attention is directed to Wrapping and Roll Paper, Shovels and Spades, Hoes, Rakes, Forks, Scythes, Lawn Mowers, Post-Hole Diggers, Vises, Bits, Saddlery Hardware, Clevises, Wagon Hardware, Forks, Carriers and Pulleys, Wrenches, Wheelbarrows, Barn Door Hangers, Sash Balances, Toilet and Horse Clippers, Window Frames and Screens, Wringers, Washing Machines, Curry Combs, Whips, Brushes, Refrigerators, &c.

H. M. QUACKENBUSH, HERKIMER, N. Y.: Illustrated price-list. Illustrations and descriptions are given of Quackenbush's Air Guns and Rifles, Targets, Nut Picks and Cracks and the many cases in which they are put up, Stair Rods and the No. 1 Lathe. In his introductory address to the trade the manufacturer refers to his long experience in the manufacture of Air Guns and appurtenances and emphasizes the satisfaction which they have given to purchasers.

GEO. D. WINCHELL MFG. COMPANY, Cincinnati, Ohio: Catalogue No. 40, illustrating Double Thick and Japanned Tin Goods. This line is handsomely represented in a publication of 64 pages. Their Double-Thick Tinware is described as made from extra heavy double-coated IXX selected plate. In their preface the company call attention to the fact that Coolers sometimes run 25 to 50 per cent. short in capacity, and that customers may be advised as to the correct capacity of their goods they give the rule by which this may be ascertained.

AMERICAN TUBE AND IRON COMPANY issue a change in list prices of their special pipe. The lists are so arranged as to be gummed over the respective lists on pages designated in their "Red Book" of January 1, 1890.

McKINNON DASH AND HARDWARE COMPANY, Black Rock, Buffalo, N. Y.: Improved Phaeton Fenders. Two styles are shown, No. 50 being a taper fender and No. 4 a fender with top curved upward. The point is made that all their fenders are attached to body irons by their concealed head bolts.

THOMPSON MFG. COMPANY, Elkhart, Ind.: Lawn Sweepers, Lawn Rollers and Warehouse Trucks. The catalogue, though small, is tasteful in make-up, having colored illustrations on the front and back covers of their Sweeper and Roller. The illustrations and descriptions of the goods are clear and satisfactory, impressing one with the feeling that no points which would be of interest to the purchaser have been omitted. This is the first catalogue issued by the company, their goods heretofore having only been distributed in a local way.

AMES PLOW COMPANY, Boston and Worcester, Mass.: Catalogue, 1892, illustrating the company's line of Plows, Harrows, Fertilizer Distributors, Seed Sowers, Corn Planters, Field Rollers, Cultivators, Horse Powers, Feed and Hay Cutters, Grain and Corn Mills, Corn Shellers, Cider and Wine Mills, Churns, Trucks, Barrows, &c.

The Plant of the Kelly Axe Mfg. Company.

IT IS A MATTER for congratulation that the United States supplies almost the entire world with axes. In this one article, at least, our supremacy is undisputed. Although the English and German cutlery makers have for centuries been in the vaa in nearly all other articles used for cutting purposes, the American Axe is the only one used to any extent in any part of the globe.

This is due to no apathy of the English or German manufacturers. The London *Ironmonger* several years ago published a series of articles on the subject, calling attention to the trade the Americans are enjoying in all English colonies, and urgently pressed the English manufacturers to retrieve themselves, but although numerous efforts have been made to do so, our foreign cousins have never been able to keep pace with the improved methods of manufacture and production of an Axe equal to that made in this country.

To one not an expert, an Axe is one of the simplest of tools, but in reality, the manufacture of the highest grade demands an amount of skill, experience and expertness which is simply astonishing to one who first realizes it.

The United States consumes about 300,000 dozen per annum of these useful tools, and the demand for a perfect article is such that nothing short of the utmost care and skill can be utilized in the manufacture. The increasing use of machinery in this line has been fully up to that of other branches of manufacture.

The Kelly Axe Mfg. Company of Louisville, Ky., have quite recently completed extensions to their plant, which is referred to as one of the largest and best equipped factories in the country.

A ground plan drawn to scale and presented herewith gives an idea of its extent.

The works are located on Sixteenth street, and take up the entire square to Seventeenth street. Switches connect each end of the factory with all the roads entering the city of Louisville, giving the works the amplest facilities for receiving and shipping.

Raw material is received in the rear, or west end, of the works, which are so arranged that the stock as it is made into finished Axes moves uniformly eastward, and when finished and ready for shipment is in the east end of the plant, where the shipping is done.

Lima oil is used throughout the forging department for welding purposes and has been found far better than coke or natural gas. Of the latter the works have an ample supply, used for tempering and lighting the works at night.

Lumber for boxes is received at the west end, so that the packing department in the east end of the factory is not encumbered with the litter incidental to putting them together.

Steam is furnished by two batteries of large improved tubular boilers, which are fed with slack fuel.

The water supply is furnished by Dean pumps. They are placed in a well 30 feet deep and force the water up into a tank 30 feet above the ground, and have a capacity of 12,000 gallons per hour.

The forging department is driven by a 350 horse-power Hamilton Corliss engine. The polishing department is driven from same engine by a rope power transmitting 100 horse-power to the polishing and packing department, thus throwing the work that is furthest away from the boilers immediately on the Corliss engine adjoining them.

The grinding, edging and tempering departments are driven by a 200 horse-power engine centrally located.

Ample facilities in Poll bins provide for a stock of 50,000 dozen Axe Polls. These bins are built of heavy oak timber and are two stories high. The first floor of the bins is for Polls and the second floor for the Axe Bitts and forged Axes.

as to render quick communication from the office to all departments of the works.

The handling and packing department is in the second story of the warehouse, and the building is provided with elevators and shutes for hoisting and lowering the

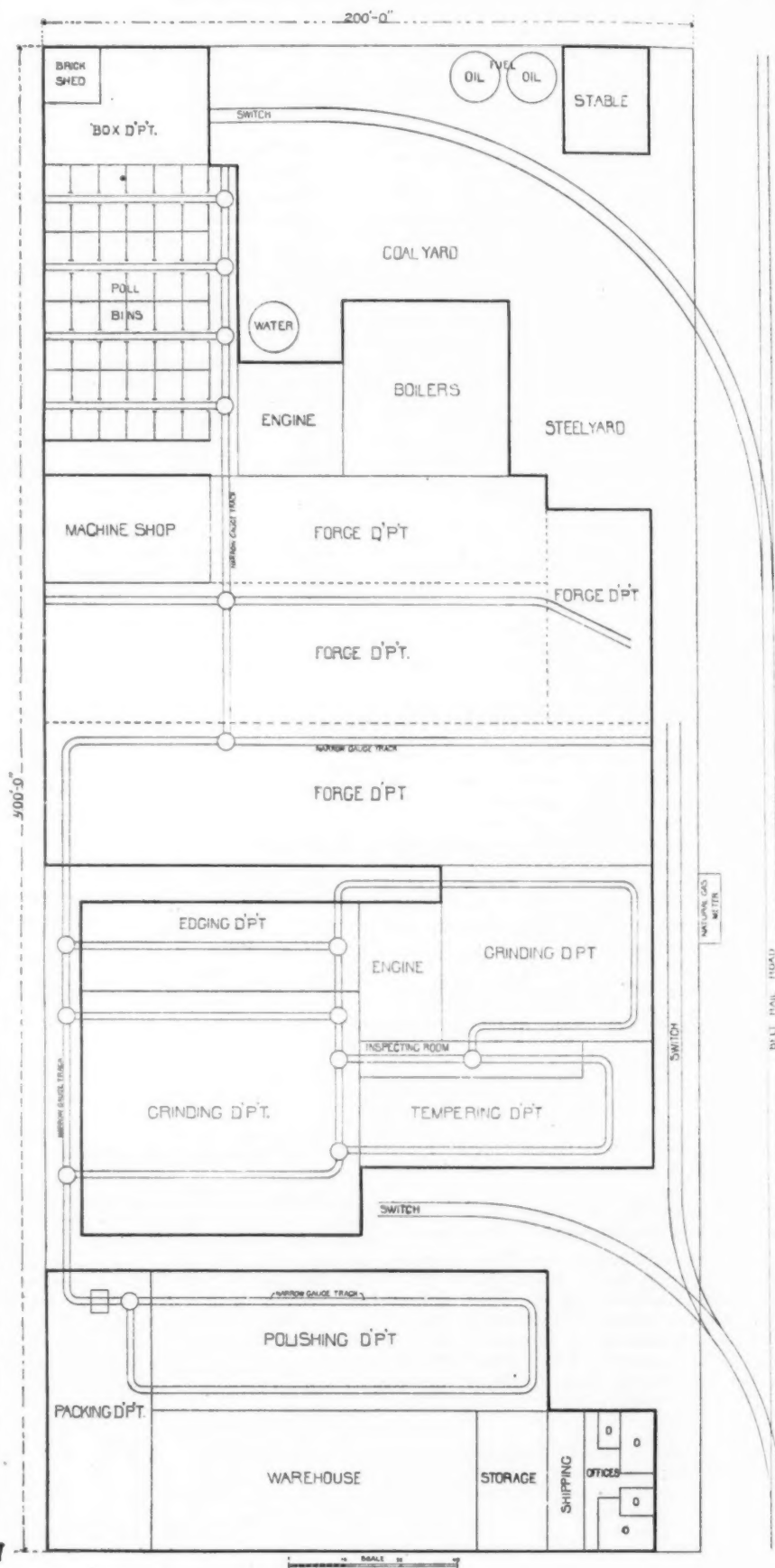


Diagram of Kelly Axe Manufacturing Co.'s Plant, Louisville, Ky.

All departments of the entire factory are connected by narrow-gauge railroads for handling the stock at the lowest possible expense. Speaking tubes from the office to each department are so arranged

Axes when ready for shipment or storage in the warehouse.

Owing to the improved engines and boilers the entire plant can be operated on a daily consumption of 250 bushels of

slack coal, which costs at the boilers 3 cents per bushel.

Owing to the large amount of machinery in operation the company have a machine shop with facilities for doing all their own work. A 48 x 48 inch planer, 20-foot stroke, takes in the largest piece of machinery that is used. Other planers of smaller capacity, lathes, drill, presses, automatic saw sharpeners, milling machines and other appliances constitute the machine shop complete in all respects. This department can be run at night by a small independent engine.

The works have a daily capacity of 4000 Axes, or about 100,000 dozen per annum. The employees of the works live immediately in the neighborhood, most of them owning their own homes. Each department has its superintendent and assistants, all of whom, some 20 in number, are stockholders in the company.

The extension of these works has been carefully planned with a view to the greatest economy in receiving and handling material and shipping the product. Considering the low price of fuel, the advantages the company realize from the co-operation of all their different foremen as stockholders, the large output of their works, and their superior facilities, the company estimate they can manufacture Axes at a lower cost per dozen than has ever yet been accomplished.

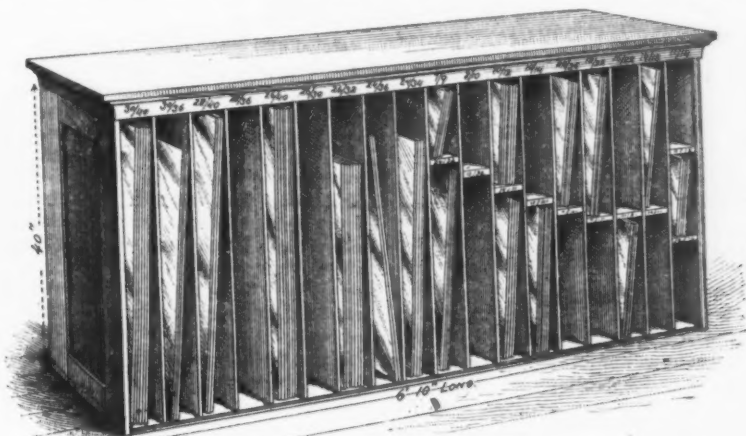
The facilities for producing uniform work are so excellent, and the system of inspection in all the departments so thorough, that the Beveled-Blade Axe made by this company has, we are advised, steadily increased in use and popularity in every section of this country, Canada, Mexico and South America. Attention is directed to the illustrations given in another column of some of the new patterns of their Perfect Axe, which they have recently made for special uses.

Quite recently a number of letters have been received by the company from ironmongers in Australia and New Zealand, stating the high favor in which this special shape is held by their trade.

As showing the modern development of the West in large manufacturing establishments this plant is certainly a conspicuous example.

A Convenient Glass Rack.

THE ACCOMPANYING illustration of a Glass rack is sent us by Henry S. Smith of Miller, Smith & Co., Chadwick, Ill., and is referred to by him as eco-



A Convenient Glass Rack.

nomical of room. In the rack a counter 82 inches long, 30 inches wide and 40 inches high inside is utilized, and may be open on either or both sides, as desired. The boxes are 4 inches wide, $\frac{1}{4}$ inch boards being used as partitions. The rack

holds 28 boxes of Glass, from 7 x 9 to 30 x 40 inches, the latter being the largest size they carry in stock. Larger sizes are furnished on special orders.

A Unique Catalogue Cover.

THE ACCOMPANYING illustration of the cover of Stanley Rule and Level Company's latest catalogue shows the tendency and is suggestive of possibilities



Design of Catalogue Cover.

in the line of catalogue covers. This one is neat and appropriate, as well as singularly distinctive. The impression likely to be made upon the mind of the merchant by such a cover would be so permanent, that when having a call for special goods, or in making up a regular order in such a line, he would naturally refer to this catalogue. There are few manufacturers whose leading or special goods would not combine in a symmetrical design for the cover. There are few manufacturers whose leading goods might not be represented in a similar way or in some manner brought into the design of the cover of their catalogues or price-lists, thus giving the book

or pamphlet something of an individual character. The attention of manufacturers may wisely be given to matters of this kind, as in these days it is advisable to resort to such expedients to secure proper attention to their contents.

Marking Imported Merchandise.

REPORTS have been made to the Treasury Department of attempted evasions of the requirements of the statutes as to the stamping of imported merchandise with the name of the country of origin. These relate especially to cutlery, and samples of goods so imported with inadequate stamping were submitted. One was a penknife on which the word "Germany" is stamped in diminutive and illegible letters, and another was a razor, on the extreme edge of the tang of which the word "Germany" is stamped in such a manner that the portion containing the word may be filed off, leaving the razor without mark to indicate its origin. In another case the goods are stamped with the firm name of American manufacturers. In a letter to the Collector of Customs at New York on this subject, Acting-Secretary Spaulding says: "As the manner in which these goods are stamped plainly indicates an intention to evade the requirements of law, you will take the necessary steps for preventing the importation of such goods, and also any others stamped in a similar defective manner." Other collectors were similarly instructed. Some complaints have been made with reference to anvils, which are sometimes imported with the country of origin indicated by a paper label pasted on in such a way that it can easily be removed, leaving no permanent indication of its foreign manufacture. Recent instructions from the Treasury Department are to the effect that a liberal interpretation is to be made after March 1 of the requirements of the law in regard to the marking of imported goods:

Cutlery and other similar articles when imported into the United States are usually and ordinarily stamped in one of three ways, viz.: First. With trade names or marks, which indicate nothing as to any country or origin. Second. With the name of a domestic dealer and the city in which he carries on business, no other indication as to a country of origin appearing upon the articles. Third. With the name of a foreign dealer and a foreign city other than the one of origin.

Such articles, in addition to the marks above specified, are required to be stamped so as to plainly indicate the country of origin, and the Department is of the opinion—First. That in cases where the usual or ordinary stamping indicates nothing as to the country of origin the name of such country should be stamped, notwithstanding the existence of ordinary trade names or marks. Second. That in cases where the collector is satisfied that the usual stamping contains the names of domestic dealers and of the city where their business is carried on as an advertisement only, and not with the intention of deceiving the consumer into believing that the United States is the country of origin, the articles should be stamped as "made in" or "manufactured in" the country of origin. Third. That in cases where a stamp upon the imported article is intended to indicate the United States as the country of its production the words "made in" or "manufactured in" should be prefixed to the stamp showing the actual country of origin. Fourth. That in cases where the usual and ordinary stamping plainly indicates a foreign country other than the one of origin, then the words "made in" or "manufactured in" should be added to the name of the country of origin.

Joseph Rodgers & Sons' Illustrated Catalogue.

JOSEPH RODGERS & SONS, Sheffield, England, who are probably the most widely known manufacturers of Cutlery in the world, have just issued through their United States agents, the well-known house of Alfred Field & Co., 93 Chambers street, New York, a handsome and comprehensive illustrated catalogue of goods especially adapted to this country's trade, in which are shown, nearly all actual size of the goods, 220 patterns of Pocket Knives, 46 of Razors, 43 of Scissors, 99 of Carvers, &c., and 36 of cased goods, besides illustrations of sundry other articles in their line. All of these goods are carried in stock by their New York agents and to these patterns any new goods the Messrs. Rodgers make will from time to time be added. It is also stated that their importation line of samples, while embracing all the goods shown in the catalogue, includes many additional patterns. This catalogue, which is, we believe, the first which has been issued in illustration of this line of goods, is a handsome volume containing 108 plates of illustrations, the cuts being of exceptional excellence, pains having been taken to secure an accurate representation of the goods and the different styles of handles. The design and workmanship of the goods are thus very satisfactorily represented. A numerical index occupies the last 12 pages of the book, in which reference is made to the illustration and description of the articles. The book is substantially bound in cloth, and the calendered paper used in it is of fine quality. The catalogue contains an illustration of the main works at Sheffield, which occupy an entire block of buildings. The first edition of this catalogue is 5000 copies, and if the demand exceeds this number a second edition will be printed.

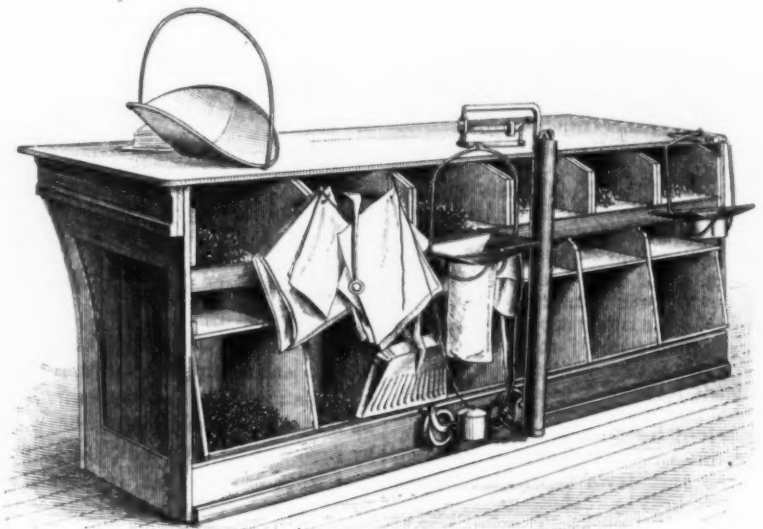
The Rodgers family have been cutlers for at least two centuries, and the history of the firm is to a very marked extent the history of the Cutlery trade of Sheffield. They occupy a whole block of buildings skirting Norfolk, Milk, Sycamore and Flat streets, Sheffield, and the view of their factory given in the catalogue shows its handsome and imposing frontage and also its extent, the factory being probably the most compact and complete in the world. Their trade mark, a Maltese cross and star, was granted them in 1764. Their showrooms were opened in 1825, and are elegantly fitted up and of much interest. Among the articles exhibited is a knife containing as many blades and instruments as there are years in the Christian era, all being perfectly distinct and no two blades or instruments alike. On the blades are etchings of the Queen of England, Prince Albert and the President of the United States, with views also of Windsor Castle, the historic American White House, and other places of interest. The Knife is generally admitted to be the most elegant and perfect specimen of workmanship in this line. Joseph Rodgers & Sons have in their employ about 2000 well organized and

skilled workmen, who turn out annually, we are advised, 166,000 Table Knives and Forks, 150,000 Carving Knives and Forks, 133,000 Pocket Knives, 66,000 dozen Razors, 42,000 dozen Scissors, besides a great variety and quantity of other articles. The utmost care and pains are constantly being taken to insure absolute uniformity in the quality of their goods, and we are advised that the same quality of steel is used in their moderate-priced articles as in the most expensive ones, the difference in price being accounted for by the more costly materials used for handles, the more elaborate enrichment and the superior finish which characterizes the higher-priced goods.

From the position occupied by this line of goods, the catalogue just issued will be of exceptional interest to the trade, the United States being one of their principal markets. As showing the hold these goods

to slip out easily. Each drawer is large enough to hold a keg of Nails. It lies horizontally just under the top of the counter when in use, and inside of a 4 or 5 inch facing.

The drawer swings on a perpendicular standard, which is hinged by double-jointed hinges to the base of the outside of the counter and drawer, and a small roller in front. To lower the Nail drawer from its position the toe is placed under the lower end of the standard, pressed lightly toward the operator, when the double hinge will give way and allow the standard and outer end of the Nail drawer to be lowered sufficiently to pass in and out of facing. After the drawer is filled the top is shoved from the operator until it strikes against the brace on standard, when it will lift in the place very easy, as half its weight will be on the standard; when in place the lower end of standard is pressed lightly with the foot, which will lock the double jointed hinge. There is an iron bar fastened crossways of the Nail drawer, 4 inches back of the mouth, which strengthens the box, and is convenient to



White's Improved Nail Counter.

have obtained in this country, we are advised within one week there was shipped to the United States 10 tons weight of the goods. Their principal markets are India, South America, Canada, Australia, South Africa, West Indies and Great Britain. For the convenience of the trade, Alfred Field & Co., who are sole agents for this country, have fitted up an attractive salesroom, which is devoted exclusively to this branch of their business, and which is in charge of a competent staff of managers. It will be their aim to keep on hand a complete and ample stock of these goods.

White's Improved Nail Counter.

THE ACCOMPANYING ILLUSTRATION shows an improved Nail counter, which is designed by J. C. White, Waseca, Minn. The cut gives a general view of the back or inside of the counter, with the scales and sack holder, as they are lowered to receive Nails from the drawer; also the space for Hardware drawers between the upper and lower Nail bins, together with the twine box, sack and paper holder, all of which are attached to the scale trucks. The upper row of Nail drawers are made 8 inches deep by 13 inches wide and 30 inches long. They are lined with sheet iron on the bottom and top so as to permit Nails

strike the keg against when emptying Nails into the drawer. It also serves as a handle by which to pull the drawer backward and forward in delivering Nails into the scale scoop. Just back of the iron bar a small hand hole is cut out, making it easy to get hold of the iron bar.

In removing the Nails from the drawer the salesman takes hold of the drawer handle and pulls the drawer suddenly forward until it strikes against frame of the counter, which stops the motion of drawer suddenly, and forces the Nails out into the scoop or sack holder, or the salesman can use his hand or Nail hook when the Nails are close to the mouth of the Nail drawer. The lower bins are filled in the usual way from the Nail keg, and the Nails are taken from them by the use of a Nail hook and dust pan. The scales run the entire length of the counter, and are so arranged as to be easily raised and lowered or swung around, as they are balanced on a round hollow post by a weight. Thus the scale, twine, paper and Nail hook are all moved by one motion to the bin from which the Nails are to be weighed. A funnel-shaped scoop is provided, as shown in the cut, with a sack holder underneath. The sack holder is so constructed, that the more Nails there are in the sack the tighter the sack is held. A scoop of the ordinary pattern is also provided for use when sheet paper is used instead of paper sacks.

After the Nails are weighed the scale, scoop, Nails and sack are raised to the level of the counter, which obviates the necessity of stooping in tying up the

Nails. To give an idea of the amount of room a counter of this kind will take up, it may be stated that a counter containing 18 patent Nail drawers and 18 places for Nails on the floor, and 18 drawers for Hardware, would be 23 feet long, 22 inches wide at base, 31 inches wide across the top and 35 inches high, although counters of all lengths are made in sections. The advantages of this form of Nail counter are referred to as follows: The scales running the length of the counter do away with the old way of going back and forth from scales to Nails, or after paper, twine or Nail hook; dirt is shaken out with the Nails and distributed equally. It is very easy to give exact weights without loss of time, as a few Nails can be quickly changed from drawer to scale, or *vice versa*; customers cannot mix or take Nails, and Nails will not be scattered on the floor, so one person can do the work of four the old way; they also save stooping. It is stated that the advantage of sacks over loose paper is that the same quality of paper can be used and much less paper required, and what is used is sold with the Nails, also saves time, and customers prefer sacks, as Nails will not spill when twine is removed. When the ordinary shaped scoop is used paper is weighed with the Nails.

It Is Reported—

That Millsbaugh & Coe, Oneida, N. Y., Hardware dealers, will remove their business to the handsome Coe block on Main street.

That Briggs & Ford, Hardware dealers at Fredonia N. Y., have remodeled their building and greatly beautified their place of business.

That the Coeur d'Alene Hardware Company have been incorporated in Montana. The company's principal place of business is at Wallace, with branches in other parts of the State. John A. Finch is president of the company and Edward H. Moffitt secretary and treasurer. The capital stock is \$200,000, \$150,000 paid in. The company will do a general Hardware and mercantile business.

That William Meeks will soon be ready to open up his new Hardware store at Crescent City, Ok.

That H. J. Shirk has opened a Hardware store at La Paz, Ind.

That the store of Smith Hardware Company, Columbus, Ohio, was burglarized on the night of the 15th ult. The stolen booty has since been recovered.

That R. S. Thompson & Son, Pine Bluff, Ark., have removed their stock of Hardware to new quarters.

That F. A. Sullivan, Middleburg, N. Y., will move his Hardware store from Railroad avenue to Main street.

That Pierce & Humphrey are a new Hardware firm at Phelps, N. Y.

That A. J. Seaman and L. S. Cramer have purchased the H. T. Hollister Hardware stock at De Ruyter, N. Y.

That Maurice Deyo and J. E. Andrews have purchased the Hardware business formerly conducted under the style of Sterling Bros., Poughkeepsie, N. Y., and will continue the same.

That Mr. Walbridge, dealer in Hardware at Colby, Wis., has retired from business.

That S. W. Duguid, Ray, Mich., has sold his entire stock of Hardware to E. Billman.

That Henry Goodman has purchased a half interest in the Hardware store of Silas Loew, Burnip's Corners, Mich.

That J. H. Gambrill, Anniston, Ala., contemplates retiring from the Hardware business.

That F. W. Holmes, dealer in Hardware, East Otto, N. Y., has sold a half interest in his business to C. H. Mason.

That Van Holde & Merson is the style of a new Hardware firm at Marion, N. Y.

The D. P. Lapham's Hardware store at Dearborn, Mich., was robbed on the 18th ult.

That W. H. Safford, Hardwareman, Farwell, Mich., has sold out his business.

That Rockford, Ill., has a new Agricultural Implement firm under the style of Harvey & Armour.

That Hockshaw & Greener, Streator, Ill., dealers in Implements, have dissolved. A new firm, Sweetzer & Greener, will continue.

That Derry & Kirkbride are a new Implement firm at Vermont, Ill.

That Charles Warenburg has succeeded to the Hardware business at La Fayette, Ind., formerly conducted by Weber & Warenburg.

That Franklin Smith has commenced the Hardware business at Summitville, Ind.

That Jones & Fleming, Hardwaremen, West Lebanon, Ind., have disposed of their business to C. E. Jones, who will continue it at the old stand.

That Kropf Bros. have recently begun the Hardware business at Farnamville, Iowa.

That Leatherman & Smith, Hardware dealers Wadsworth, Ohio, have dissolved partnership, the latter retiring.

That the new store of D. K. McRae & Co., Hardware dealers, Velasco, Texas, will be opened for business in a few days.

That David Cartmell and John Bockus are going into the Hardware business at Middlebury, Ind.

That H. O. Barber has purchased a half interest in Fletcher's Hardware store at Milledgeville, Ill.

That Hibbard & Newman will open a new Hardware store at Fayetteville, N. Y., in the spring.

That W. E. Bunney, Belleflower, Ill., has sold his Hardware store to Mr. Teal of Flannagan, Ill.

That Robinson & Young are a new Agricultural Implement firm at Manchester, Iowa.

That the Pratt Hardware and Implement Company have been incorporated at Pratt, Kan. The capital stock is \$12,000.

That Rucker & Long, Hardware merchants, Georgetown, Ky., have dissolved partnership. Rucker & Richards will continue the business.

That Johnson & Christianson have commenced the Agricultural Implement business at Minden, Neb.

That Galley & Campbell have recently begun the retailing of Implements at Nelson, Neb.

That Scott & McDaniels, dealers in Hardware, Stoves, &c., Omaha, Neb., are out of business.

That J. L. Breckenridge has lately started in business at Wilmington, N. C., dealing in Hardware and House-Furnishing Goods.

That Probasco & Patterson will open up a large Hardware store at Huron, Kan.

That W. H. Gordon & Co., Hardware dealers, Marion, Ohio, are closing out their business.

That Hummons & Fifer, dealers in Hardware, Stoves and Implements, Leipsic, Ohio, have dissolved partnership. T. F. Hummons will continue.

That Peter Herman & Son have commenced the Implement business at Norwalk, Ohio.

That J. E. Deery, dealer in Hardware and Vehicles, Shelbyville, Tenn., has been succeeded by Deery & Robinson.

That Gass & Ramsey, dealers in Implements, Ellensburg, Wash., have dissolved.

That Chambers & Smith have commenced the Implement business at Waukesha, Wis.

That Wm. T. Dust will soon commence the erection of a brick block at Detroit, Mich., part of which he will occupy as a Hardware store.

That John J. Bannon's Hardware store, 720 West Madison street, Chicago, was entered by burglars on the 18th inst., and about \$100 worth of goods stolen.

That Mr. Organ has purchased a one-third interest in the Hardware business of C. H. Debolt & Co., Vincennes, Ind.

That A. Augsburg and R. Young have bought the Hardware store of Otis & Moore, Kenton, Ohio.

That W. M. Scott will open a Hardware store shortly at Bethel, Ohio.

That the Hardware store of A. M. Nelson & Co., Culpeper, Va., was broken into by burglars on the 19th inst., and a few pistols stolen.

That Frank Dampman, West Chester, Pa., has bought out a Hardware store in Philadelphia.

That the Straub Hardware Company, Creede, Col., have disposed of their stock and building.

That William Meeks, Crescent City, Ok., will soon be ready to open up his new Hardware store.

That Lewis Fletcher has purchased E. J. Stansbury's interest in the Hardware firm of Webb & Stansbury, Chippewa Falls, Wis.

That Emmons Bros. & Co., Marquette, Mich., are now comfortably located in their new Hardware store.

That there is an opening for another Hardware store at Wolfeboro, N. H.

That T. J. Tradewell & Co. of Morton, Minn., Hardware dealers, have sold out to Levi Robinson and Fred. C. Watschke, who will continue the business.

That the Hardware business conducted by J. R. Hewitt at Jackson, Cal., is for sale.

That A. M. Smith & Co. are a new Hardware, Stove and Agricultural Implement firm at Kasbeer, Ill.

That G. H. Swan, Hardware dealer, Suspension Bridge, N. Y., is remodeling his establishment, making it more convenient and attractive.

Price-Lists, Circulars, &c.

BRITTAN, GRAHAM & MATHES, Pittsburgh, Pa.: In connection with their 1890 catalogue, the company are issuing separate sheets representing recent additions to their line. These include Sliding Door Sets, Inside Door Sets, Front Door Sets and Sliding Barn Door Locks.

MARYLAND BOLT AND NUT COMPANY, Baltimore, Md.: Catalogue 1892 representing the Bolts, Nuts and Washers of every description manufactured by the company. *Fac-similes* of the labels used

on their goods are given. Their factory is referred to as fitted throughout with the most approved machinery and capable of producing 75,000 finished Bolts and 10,000 pounds of Nuts and Washers per day.

TERRY MFG. COMPANY. Horseheads, N. Y.: Catalogue of Hardware specialties. It illustrates their Star-Braced Steel Track, Standard Bracket Track, Double-Braced Track, Thimble Bracket Track Wrought Hanger, Shield Anti-Friction Hanger, Solid Steel Anti-Friction Hanger, Leader Anti Friction Hanger, Improved Stay Rolls, Door Pulls, Steel Wire Cutter and Plier, Steel Carriage Wrenches, Surface Chest Handles, Molasses Gates, Grindstone Fixtures, Well Wheels, Harness Hooks, &c. The company's Modern Anti-Friction Hanger is referred to in a separate circular.

D. W. BOSLEY COMPANY, Chicago: Circular illustrating their Peerless Rubber Window Cleaner, Rubber Floor Scrubber, Rubber Bar and Counter Cleaner. They state that their Window Cleaner will hereafter be made with a sheet-iron socket handle which will not break. A card is also issued relating to the Excelsior cheap pure Rubber Floor Scrubber.

GARR, SCOTT & Co., Richmond, Ind.: Catalogue illustrating and describing the Gaar-Scott Traction Engines, Plain Portable Engines, Three-Way Crank Threshers, Clover Hullers, Extension Automatic Self Stacker, Standard, Pony and Plantation Saw Mills, Straw-Burning Engines, &c.

WILLIAM H. BROWN, Worcester, Mass.: Catalogue of Carders' Tools. Illustrations and descriptions are given of Card Ratchet, Lewis patent Card Clamp, Kimball's patent Card Sheet Stretcher, Card Hammers, Card Gauge, Card Sheet Marker, Scrapers, Card Cleaner Holder, Pick Counter, Improved Wire Cutter, Perfected Lathe Center Grinder, Card Tubes, &c. The Universal Knife Grinder is also shown.

COLLIER SHOT TOWER WORKS, St. Louis, Mo.: Shot in pound boxes. Illustrations are given of a 25 pound case filled with pound boxes of shot; also of a 1-pound paper box containing Shot. It is explained that the inconvenience and loss attending weighing out small lots of Shot has been entirely overcome by putting up Shot of all sizes in 1-pound packages, so as to cause no more trouble in selling Shot than in selling Tacks or Rivets.

BROMWELL BRUSH AND WIRE GOODS COMPANY, Cincinnati, Ohio: Catalogue 1892. This house was established in 1819, and the catalogue is their 73d annual one. The extensive line of goods manufactured by the company are shown. In the notice to the trade the company state that in order to meet promptly the constantly increasing demands of their trade, they have added another factory to their plant, giving them an exceptionally large capacity. The company now employ 800 persons.

W. J. KELLEY COMPANY, Greenville, Ohio: Catalogues and price-lists issued by them as agents for manufacturers of Shafts, Poles, Single Trees, &c., and Pumps. The Chicago office of the company is mentioned as 945 Rookery.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

In the market for Paints and Colors business is of very fair proportions, but the improvement does not appear to wholly meet previous expectations and

early spring season results are thus far barely up to the average. There exists a feeling of confidence that a very different condition of affairs will be experienced during the next two or three weeks, however, since uncertainties that have surrounded the condition of the market for various Paint-making materials and caused buyers to observe more than ordinary caution are now out of the way, while general conditions are looked upon as being favorable for a liberal spread of Paint in nearly all quarters that draw supplies from this market. Very little movement in prices has taken place, and, with some few unimportant exceptions, the undertone is quite firm. Linseed Oil has taken the upward turn that has been foreshadowed for several weeks, which fact alone has nothing if not a restraining influence upon lower prices for various lines of Paints, and in the condition of the market for other ingredients there is nothing whatever in the way of counterbalancing influence at the present time.

White Lead.—Corroders have enjoyed a somewhat freer run of orders for their chief product, and the reports of various branches of the National Lead Company, as well as those emanating from various branches of the combine, go to show that sales have been larger the past week than those of the preceding one. The transactions involve some good-sized contracts for supplies for future delivery, in addition to the general run of small orders, and indicate that the stock carried in second hands latterly has been none too large for convenience. Manufacturers of mixed Leads note rather better sales to buyers in the immediate vicinity and somewhat larger returns also from salesmen on the road. Upon the whole the distribution would thus appear to be getting well up to full average volume for the season, and according to all accounts, the improvement is not due in any measure to any new inducements in the way of concessions to buyers. For that matter, the market is at present showing uniformly better tone than has appeared upon the surface previously this year.

Litharge, Red Lead, &c.—There has been a very fair movement in the low grades of Litharge, adapted to glass-makers' wants, and rather more doing in the finer qualities employed in the Paint trade. Red Lead has also had slightly freer but not remarkably large sale. Orange Mineral is moving out fairly, but chiefly in a routine way. Prices throughout stand the same as they were last week, and the market, generally speaking, is quite firm.

Zincs.—In the position of the market for American Oxide there is no distinctively new feature. Production is going ahead on a large scale, but deliveries continue heavy, and, while there are faint indications of accumulation in some quarters, the surplus supply does not prove to be sufficient to bear adversely upon the friendly arrangement under which manufacturers have been working for some time past, and the former range of prices prevails. Foreign brands are meeting with seasonably good, but not remarkably brisk sale, and remain steady at old prices.

Colors, &c.—In the general line of Dry Colors business is of somewhat larger volume, although chiefly of routine character, and Oil Colors have had rather freer movement also, and, while the recent innovation of the National Lead Company is not without effect, the general distribution is getting well up to the usual volume for the season.

Oils and Turpentine.

In this line the prominent features have been an advance in prices of Linseed Oil and a further decline in the price of Spirits of Turpentine. The rise in Linseed Oil is

due in part to larger sales in nearly all sections, but has a certain measure of assistance from more temperate competition, resulting, it is asserted, from more friendly relations among Western crushers. The decline in Turpentine has its explanation in the brief but cogent statement that the February speculative "boom" was carried too far and collapsed for want of monetary support. Next to the features above outlined the most prominent have been a tendency toward lower prices for Cotton-Seed and Lard Oils, due in part to sluggish demand and incidentally to a weaker tone to the market for Lard. Other Oils have been free from important change or really new features.

Linseed Oil.—City crushers have marked up their price for Oil made from domestic seed to 38¢, but keep the quotation for Calcutta seed product at 56¢. Out-of-town brands that were on the market a week ago at 34¢ @ 35¢ are now held at 36¢ @ 37¢, and the offering of the same in this market and immediate vicinity is momentarily reserved. The report has circulation that Western producers who were recently at swords' points have agreed upon a more peaceful policy for mutual financial welfare, and that other outside interests are inclined to join the procession, since recent conflicts have resulted in greater or less loss to all concerned. Rumor goes even further and intimates that a strong combination has been formed and that prices will be further advanced in the near future, but on this point reliable information is wanting. That the market is showing better tone cannot be questioned, however, and it is the general report that sales have been larger the past week than during any corresponding period this year.

Cotton-Seed Oils.—Business in this line has dragged rather wearily, and nothing has occurred that would tend to relieve the depressed condition of affairs that has prevailed for some time past. This class of Oils, in fact, seems to suffer more or less from the depression prevalent in Southern products generally and in cotton particularly, while advices from European markets are still the reverse of encouraging to hopes of improvement from that quarter right away. The power of three leading producers to stave off the natural weight of existing adverse influences has a certain measure of force, however, and thus far there has been no radical change in values, although the tone of the market is unquestionably weak. Transactions have been chiefly at prices on the basis of 25¢ for prime quality crude, and 29¢ for prime Summer Yellow.

Lard Oil.—The market for this commodity is weaker, suffering as it does from lower prices for raw material that go a good way in the direction of offsetting the influence of a very good demand for Oil. For prime city product 57¢ is the price generally quoted, while 56¢ has been accepted on actual dealings, and on out-of-town brands 55¢, which was exceptional a short time ago, has become common the past few days on parcels for near future delivery.

Miscellaneous.—Nothing new has transpired in the market for any variety of Fish Oil, or for Olive, Coconut or Palm Oils. Business rather slow throughout.

Spirits Turpentine.—The late speculative "boom" has passed away. There is not a vestige of it left. The statistical position is strong, but consumptive demand is merely fair, and little business was done at better than 36½¢ for regular, or 37¢ for machine barrels, in wholesale lots, until within the past few days, when fairly liberal purchases caused an advance of 1¢ per gallon. Subsequently a rise to 38½¢ @ 39¢ took place under the influence of stronger advices from the Southern markets.

New Patterns of the Kelly Perfect Axe.

We illustrate herewith some new patterns of the Perfect axe, made by Kelly Axe Mfg. Company, Louisville, Ky., whose new plant is described on another page. The Company's New York office is with Surpleas, Dunn & Alder, 97 Chambers street. In these patterns the trade will observe the general features possessed by their Perfect axe, with which our readers are



Fig. 1.—An Asphaltum Axe, Weight 8 Pounds.

familiar, but will observe that they differ in shape and appearance very widely from the regular article. Fig. 1 represents an asphaltum axe which they have quite recently put on the market to meet a demand from paving companies for an axe for cutting up asphalt. It is made regularly 8 pounds in weight. Fig. 2 shows a Jersey axe, which is used principally in the mines of Eastern Pennsylvania. It is made in very light weight, about 2 pounds being usual. Fig. 3 is also a light axe used principally in California for fell-



Fig. 2.—A Jersey Axe, Weight 2 Pounds.

ing the red woods of that State. This pattern, it will be observed, has a long and slender blade, so as to cut with facility through the thick bark. This axe is used, we are advised, with a handle of unusual length. A turpentine axe is shown in Fig. 4. It is used for boxing pine trees. Its usual weight is about 7 pounds

and the average length of head about 14 inches. It is thus adapted to cut the deep boxes near the root of the tree into which the sap flows and accumulates. These boxes are made about 8 inches deep. The



Fig. 3.—A California Axe, Weight 3 Pounds.

extent of the demand for such an axe is indicated in the fact that annually about 3,000,000 of such boxes are cut. Apart from the representation of this line of goods these engravings illustrate the fact, with which the trade are in a general way familiar, that different localities and uses

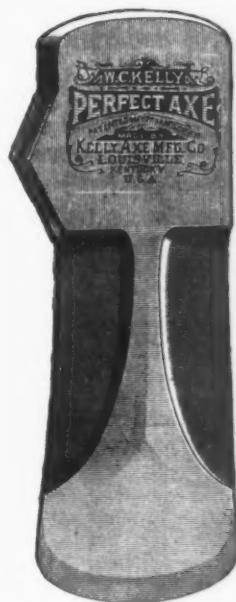


Fig. 4.—A Turpentine Axe, Weight 7 Pounds.

have their distinctive patterns of axes. It also illustrates the enterprise with which manufacturers meet the different demands of all classes of consumers.

The Mallory Wheeler Company, New Haven, Conn., and 64 Reade street, in referring to the special features of their No. 7263 Front-Door Locks, state that they have short steel keys, and that the night work is susceptible of being master keyed to 1000 changes, making it especially adapted for office buildings. Their No. 91,114 Store-Door Locks also have short steel keys, and the manufacturers state, as

the changes of keys are practically unlimited, it is offered with the guarantee that no two locks will be made with interchanging keys. This feature, it is remarked, with other construction ones, and the fact that these goods maintain the high-class standard for excellence, make them desirable locks for use on store doors.

The Baumann Curling-Iron Heater.

Union Mfg. and Plating Company, Chicago, are making the Baumann Curling-Iron Heater, the construction and use of which is represented in the accompanying



The Baumann Curling-Iron Heater.

illustration. This heater is not exposed to the flame of the lamp, and with it, it is stated, irons can be heated in two minutes. A uniform heat is retained. It is obvious that the handles of the curling iron cannot be burned in using this heater, which is arranged for two irons, so that one can be used while the other is being heated. The device is described as made of Russia iron, with polished brass ends and springs.

Pattern-Makers' Vise.

The vise represented herewith is put on the market by Hollands Mfg. Company, Erie, Pa. The jaws are leather faced and always open parallel, but can be adjusted



Pattern-Makers' Vise.

to catch taper by loosening screw at the bottom. This vise is made 42 inches in height, with 6-inch width of jaw and screw $1\frac{1}{2}$ x 24 inches.

The No-Slam Screen Door Check.

Sargent & Co., New Haven, Conn., and New York, are introducing an automatic



Fig. 1.—The No-Slam Screen Door Check.

screen-door check, as shown in Fig. 1. It consists of a nickel-plated plate and wire, to the lower end of which a solid rubber

slamming. The motion of the door in closing swings the ball toward the outer edge of the door, so that in closing the ball comes between the edge of the door and the door frame. The door then rebounds, and the ball swings in the opposite direction, allowing the door to shut

for the swinging clamps. The brackets are provided with three holes each, so arranged that the clamps may be adjusted to any thickness of washing machine, box, tub or stationary laundry tubs up to 1½ inches in thickness. The manufacturers state that the wood frame is made of the



Slager's Ideal Clothes Wringer.

quietly. The check can be applied to any screen door in connection with any door spring or spring hinge, and is referred to as a durable check, and as one that will not rack the door.

Slager's Ideal Clothes Wringer.

The G. S. Foos Company, Springfield, Ohio, are introducing the wringer, as il-

best seasoned sugar lumber, covered with two coats of good varnish; that the spring is of the best oil-tempered steel, and will stand a breaking test of 1½ inches depression at its center; that the upper roll bearings are of galvanized cast iron and indestructible, and that the rolls are of the best Para rubber, warranted.

Side Weight Hind Shoe.

Rhode Island Perkins Horse Shoe Company, Providence, R. I., for whom J. C. McCarty & Co., 97 Chambers street, New York, are agents, have recently added to their line the Hind Side Weight Shoe which is illustrated herewith. The company refer to the expense of turning this style of shoe by hand as large, and for this reason its use has been to a certain extent



Side Weight Hind Shoe.

limited, although it is a well-known fact to horseshoers that a large proportion of horses wear the outside of the hind shoe much faster than the inside. The shoes are made concaved in order to avoid throwing mud, stones or snow, and it is stated that it is almost impossible to pick up a stone with them. The price put upon them is alluded to as about one-half that of the cost of the hand turned. The shoes are made in Nos. 0, 1, 2, 3 and 4, rights and lefts, and are put up in all cases with rights and lefts in the keg.

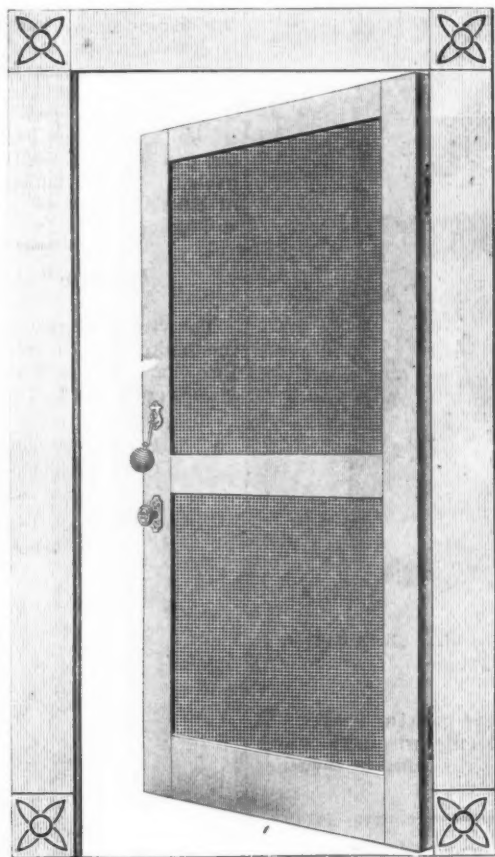


Fig. 2.—Application of No-Slam Door Check.

ball is attached. The ball is 1½ inches in diameter, and the check is 4 inches long over all. Fig. 2 shows the position in which it is fastened on the door; also the manner in which it prevents the door from

illustrated herewith. The central portion of the ends of the frame consists of a single piece of malleable iron so shaped as to form bearings for the lower roll shafts, braces for the wood uprights and brackets

Moore's Anti-Friction Differential Chain Pulley Block.

This block, manufactured by the Moore Mfg. and Foundry Company, Milwaukee, Wis., is represented in the accompanying illustrations. In this block the hand and



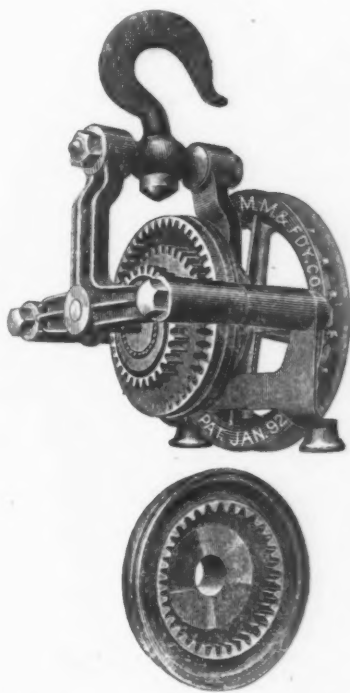
Fig. 1.—Moore's Anti-Friction Differential Chain Pulley Block.



Fig. 2.—Details of Block.

lift chains are separate and independent. The lift chain, therefore, it is stated, has such a slow movement as to avoid the great wear both on chain and sprockets, which follows where one chain serves both as a hand and lift chain. The leverage is obtained by a gear and pinion movement. It is explained that there is no end thrust of a worm shaft and no wear of a worm and worm wheel. The durability of the

gear and pinion movement is referred to by the manufacturers of the block. The teeth in the pinion and annulars are of the same pitch, and are described as fitting without grinding or wedging. Anti-friction rollers are placed between the eccentric and pinion to reduce friction. By this arrangement the company make the point that the large loss by friction in blocks which act on the principle of a wedge is almost entirely overcome. The pinion is double—two sizes in one casting. The line on which the letters A, B, F, C, as shown in Fig. 2, is the lever. The fulcrum is an imaginary point (F) on the line of the lever midway between the pitch lines of the small and large pinions. The annulars or internal gears are in mesh with the two pinions or double pinion at points B and C on the above-named lever. The lever operates on the annulars at these points, and since the lift chain hangs from opposite sides of these annular wheels, they are pulling in opposite directions, one on each side of the imaginary fulcrum. Turning the eccentric slightly, the lower part to the right, and imagining the fulcrum stationary, the point A of the lever moves to the right and the point B of the lever will move in the same direction, but the point C being on the other side of the fulcrum will move in an opposite direction, the two points B and C carrying with them the annular or lift chain wheels in opposite directions. It will thus be seen that whatever the position of the eccentric and pinion the relative position of this imaginary line or lever is always the same. It is claimed by the manufacturers that one man can lift to the full capacity of the block, that the block is self-sustaining at any point, and that it always hangs plumb. The computing of the exact speed of the block is rather an intricate problem, and the company offer as a prize a 1-ton block for the first solution carried out to three decimal places received at their office. The pitch diameter of hand wheel is 10.22 inches,



Economy Feed Box.

The George D. Winchell Mfg. Company, Bank and Riddle streets, Cincinnati, Ohio, are offering this article, as shown in Fig. 1. The feed box is constructed of heavy



Fig. 1.—Economy Feed Box.

sheet iron, galvanized after being made, which it is stated closes all seams and makes it perfectly water tight. The follower, as shown in Fig. 2, runs on slides inside the feed box, the object being to compel the horse to take up his oats in small quantities, and not by the mouthful, as is usually done by spirited and hungry animals. The point is made that as the animal eats slowly he naturally moistens his oats, which avoids the necessity of wetting the feed. The point is made that

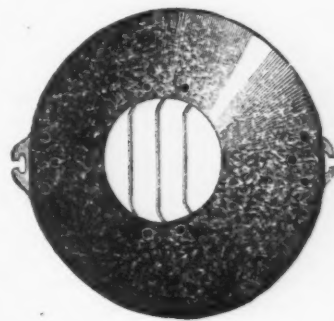


Fig. 2.—Follower to Feed Box.

it is not necessary to remove the follower, but that the oats are poured into the box and the follower pulled up, which then follows down until every grain is consumed. The ring, or fitting into which the feed box sits, is of cast iron, attached by hinges to a heavy board, or may be screwed to the wall or wainscoting of any box stall. When not in use the box may be taken out, the follower removed for cleaning, the snap hooks loosened from the ring, which allows it to drop down against the wall out of the way. It can be moved from one part of the stall to another, and is recommended for the use of racehorse men while traveling with their horses, as it takes but a few minutes to put it up in a car.

Chainless Telegram Cycle.

Sercombe-Bolte Mfg. Company, 355 and 357 East Water street, Milwaukee, Wis., have broken away from prescribed English patterns in the construction of the above machine, an illustration of which is given herewith. The wheel as represented has a 30-inch driving wheel, geared to 60

the cover open, being shown in the accompanying illustration. The capacity of the manufacturers is 100 cans daily. The bodies and bottoms of the cans are made of sheet steel corrugated and galvanized after being put together. The bottom is deeply inverted and has an extra iron band riveted to the wired edge. It is said that the bodies and bottoms are united in a way



Chainless Telegram Cycle.

inches, and a 26-inch rear wheel. It is fitted with cushion or pneumatic tires, and is easily steered with the feet on the pedals without making any use whatever of the handles. It is stated that the position of the rider is identically the same as on the improved model of English safeties, the saddle being in the exact position relative to the pedals as on the Humber. The construction of the front hub is referred to as being readily appreciated, as there are 172 balls used in it alone, the gear being constructed and planned entirely by F. H. Bolte, as well as the frame and other details. It is stated that the entire weight of the cycle stripped of mud guards for heavy road use, suitable for a 200-pound rider, is 27 pounds. It is possible to make the weight of this machine fully 10 pounds less than a rear driver by doing away with the sprocket wheels, chain, crank hanger, &c. The machine is described as having tangent spokes, finest quality; curved drop handle bars; double steel frame; best light steel hub to rear wheel; front hub, including ball bearing gear, of finish hardened steel, and geared to 56, 60 or 64 inches. The manufacturers state that it is unquestionably superior to other styles of geared ordinaries, from the fact that the front wheel is only 30 inches, whereas the driving wheels of the English machines of this class are from 40 to 46 inches in diameter. By thus reducing the size of the front wheel perfect safety is insured to the rider.

The manufacturers add that several parties who have ridden it have pronounced themselves, emphatically, converts to this class of mount; its ease of propulsion, simplicity of construction and light weight all contributing to its success.

The Baltimore Improved Oil Can.

Matthai, Ingram & Co., Baltimore, Md., have just completed machinery for making their Baltimore Improved Oil Can, a general view of one of these cans, with

to give the greatest strength, while the galvanizing being done after the can is made renders them absolutely tight. The makers also refer to the corrugations as giving additional strength to the cans and rendering them less liable to damage in



The Baltimore Improved Oil Can.

shipping. The pump socket is solid and is said to have a strong and rigid fastening that is simply and easily adjusted. The pump valves are made entirely of metal. The cans are japanned in bright red and attractively decorated. As shown in the illustration, a set of three measures and a funnel are packed with each can. The weight of the can complete is 60 pounds.

New Mail Box.

Samuel C. Tatum Company, Cincinnati, Ohio, are just putting on the market the mail box, a view of which is presented herewith. This box has ample capacity for official envelopes and with the wire mail holder at the top will hold papers and packages which from their size cannot be deposited inside the box. The mail holder may also be used for letters awaiting the postman's call, all being in plain sight. There is also a very ingenious arrangement which adapts the box for use on the inside of the door if preferred. The box is of ornamental design and is offered



New Mail Box.

at a low price. The company refer to the continued efforts of the Post Office Department to simplify the matter of free delivery as making it desirable for dealers to be prepared to meet an increased demand for this line of goods.

Smith's Patent Excelsior Belt Fastener.

Luke Smith & Co., Poughkeepsie, N. Y., are introducing this fastener, which is



Fig. 1.—Smith's Patent Excelsior Belt Fastener.—Ready for Attaching.

represented in the accompanying illustrations. This fastener is suitable for all kinds of belts, and especially for cotton and

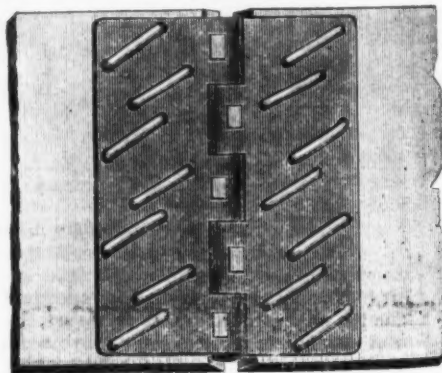


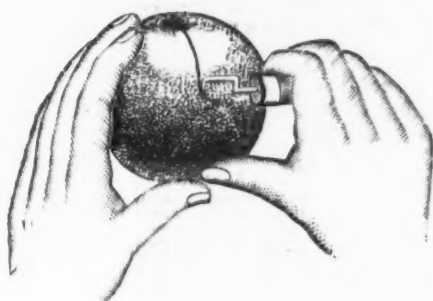
Fig. 2.—Finished Joint.

rubber belting. One of its special features is that the pins are not in straight lines, thus contributing strength. The pins are

described as made of Bessemer steel, case hardened. These fasteners may be used an indefinite number of times, fresh pins only being necessary. All the parts are interchangeable. The fastener presents a smooth surface to the pulley, a feature which is of considerable importance in high-speed belts. It is also stated that there is no extra strain on the belt when passing over the pulley as the joint is perfectly flexible. The manufacturers likewise lay emphasis on the durability of the device. It is made in six sizes, 2, 2½, 2¾, 3, 3½ and 4 inch, and is put up in boxes containing 1, 3, 6 and 12 dozen.

West's Orange Peeler.

The orange peeler represented in the accompanying illustrations is manufactured by Robert S. West, 48 and 50 Long



West's Orange Peeler.—Fig. 1.—Manner in which the Peeler is first Applied to the Rind.

street, Cleveland, Ohio. The construction of the device will be understood from an inspection of Fig. 1, which also indicates the first step to be taken in peeling an orange. Fig. 2 shows the manner in which



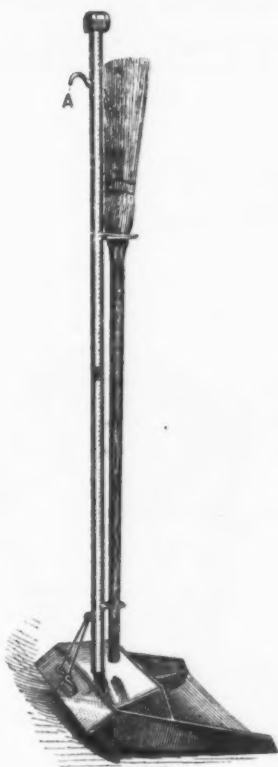
Fig. 2.—Method of Removing the Rind.

the rind is removed. The peeler proper is of steel turned in the shape illustrated, and is firmly secured in a handle enameled and of convenient form.

The Upright Dust Pan.

Craighead & Kintz Company, Ballardvale, Mass., are putting on the market a novel dust pan, an illustration of which is given herewith. The construction of the device will readily be inferred from an inspection of the engraving. The dust pan sets squarely on the floor, so that it collects the sweepings while the operator is in an upright position, no stooping being necessary. When it is desired to empty the contents of the pan the back is raised by simply placing the finger at A and moving the hook toward the end of the dust pan handle. The sweepings are then readily discharged. The convenience of this dust pan, which, it will be perceived,

may be hung up, is obvious. It is finished in brass and is offered at a price, we are advised, that puts it within the reach of all housekeepers. The broom and dust pan



The Upright Dust Pan.

are put up together. The handle is easily detached from the pan, so that the article can be shipped knocked down.

Myers Combination Spray Nozzle.

F. E. Myers & Bros., Ashland, Ohio, are introducing this article, as shown in the accompanying illustration. They refer to the fact that the success of spraying and of a spraying apparatus depends largely on the nozzle used. They make the claim that their nozzle will throw a spray as fine



Myers' Combination Spray Nozzle.

as mist, not allowing any drops to escape, thus diffusing the arsenites properly and in a way that is not injurious to the foliage. This nozzle will also throw a solid stream. They state that the nozzle is not an experiment, having been fully tested during the past season.

CONTENTS.

	PAGE.
The Johnson Engine Lathe. Illustrated....	495
Naval Officer of Customs	495
Basic Steel Profits.....	495
A Convenient Table.....	495
The Strength of Car Couplers.....	496
The Reynolds Molding Machine. Illus....	497
Basic Slag for Fertilizing.....	497
Oil as Fuel. Illustrated.....	498
The Curtis Pipe Threading Attachment for Lathes. Illustrated	499
The Corliss Steam Engine Governor. Illus..	500
The Carbon Iron Company.....	500
The Troy Malleable Iron Works.....	501
Sears' Internal Ratchet. Illustrated.....	501
Low Prices on Cast Pipe.....	501
The Lunkenheimer Regrinding Globe Valve. Illustrated.....	501
The William Cramp & Son's Ship and Engine Building Company.....	502
Aluminum.....	502
The Halsey Portable Boring Bar. Illus....	503
World's Fair Notes.....	504
Triple Architectural Iron Punch. Illus....	505
The McGrath Ratchet Drill. Illustrated....	506
San Francisco News.....	506
Yachts.....	507
Houston's Adjustable Metallic Packing. Illustrated.....	507
Tempered Copper.....	507
American Armor. Illustrated.....	508
The Week	509
Trade Publications.....	510
Editorials:	
The Progress of Steel	511
The Copper Agreement.....	511
Progress of Smoke Prevention in Chicago.	512
The Southern Consolidation.....	512
Recent Improvement in Bessemer Practice.....	512
The Growing Consumption of Ten Per Cent. Spiegeleisen.....	512
Obituary.....	513
Pittsburgh Freight Rates.....	513
The McCullough Iron Company.....	514
The Southern Consolidation.....	514
Pittsburgh and Valley Freights.....	514
Manufacturing:	
Iron and Steel.....	515
Machinery.....	515
Hardware.....	516
Miscellaneous.....	516
Trade Report:	
Pittsburgh.....	517
Chicago.....	518
Philadelphia.....	518
Louisville.....	519
Cincinnati.....	519
St. Louis.....	520
Cleveland.....	520
Detroit.....	520
New York.....	520
Metal Market	521
Coal Market.....	521
Financial.....	521
Imports.....	522
British Iron and Metal Markets.....	522
Bids for the New McComb's Dam Bridge....	522
Hardware:	
Condition of Trade.....	523
Notes on Prices.....	524
Hardware Organization in New York.....	525
Trade in Denver.....	525
Our Foreign Representative	526
Fires in Cleveland	526
Trade Items.....	527
Business Principles.....	527
J. C. McCarty & Co.....	527
Net Prices.....	527
Cycles.....	528
Price-Lists, Circulars, &c.....	529
The Plant of the Kelly Axe Mfg. Company. Illustrated.....	530
A Convenient Glass Rack. Illustrated....	531
A Unique Catalogue Cover. Illustrated....	531
Marking Imported Merchandise.....	531
It is Reported.....	532
Paints and Colors.....	534
New Patterns of Kelly Perfect Axe. Illus..	535
The Baumann Curling-Iron Heater. Illus..	535
Pattern-Makers' Vice. Illustrated.....	536
The No-Sam Door Check. Illustrated.....	536
Slager's Ideal Clothes Wringer. Illus....	536
Side Weight Hind Shoe. Illustrated.....	536
Moore's Anti-Friction Differential Chain Pulley Block. Illustrated.....	537
Econom: Feed Box. Illustrated.....	537
Chainless Telegram Cycle. Illustrated....	538
The Baltimore Improved Oil Can. Illus....	538
New Mail Box.....	538
Smith's Patent Excelsior Belt Fastener. Ill.	538
West's Orange Peeler. Illustrated.....	539
The Upright Dust Pan. Illustrated.....	539
Myers Combination Spray Nozzle. Illus....	539
Current Hardware Prices.....	540
Current Metal Prices.....	546

CURRENT HARDWARE PRICES.

MARCH 16, 1892.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.

Domestic..... \$ dos \$3.00, 35¢
Exterior..... \$ dos \$10.00, 50¢
North's..... list net \$105
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils.

Eagle Anvil, \$ 10¢..... 15¢
Peter Wright's..... 11¢
Armstrong's Horse Shoe..... 10¢
A. D. Wright, Horse shoe brand, 11¢
Trenton..... 10¢
Wilkinson's..... 10¢
Moore & Barnes Mfg. Co..... 35¢

Anvil Vise and Drill—

Millers Falls Co., \$10.00..... 20¢
Cheney Anvil and Vise..... 25¢
Allen Anvil and Vise, \$3.00..... 40¢
Star..... 45¢

Apple Parers—See Parers, Apple.

Augers and Bits—

Douglas Mfg. Co..... 70¢
Wm. A. Ives & Co..... 70¢
Humphreysville Mfg. Co..... 70¢
French, Swift & Co. (F. H. Beecher, P. S. & W. Co.)..... 70¢
Rockford Bit Company..... 70¢
Cook's, Douglas Mfg. Co..... 55¢
Cook's, M. E. Copper Co. \$5.00..... 50¢
Ives' Circular Lip..... 60¢
Patent Solid Head..... 60¢
C. E. Jennings & Co., No. 10, extension lip..... 40¢
C. E. Jennings & Co., No. 30..... 60¢
C. E. Jennings & Co., Auger Bits, 25¢ quarter, No. 5, 45¢; No. 30, \$3.50
Lewis' Patent Single Twist..... 45¢
Russell Jennings' Augers and Bits..... 45¢
Imitation Jennings' Bits..... 60¢
Pugh's Black..... 30¢
Pugh's Jennings' Pattern..... 45¢
Car Bits..... 60¢
Car Bits, P. S. & W. Co..... 60¢
Snell's Car Bits..... 60¢
L. Hommedieu Car Bits..... 60¢
Forester Pat. Auger Bits..... 20¢
Olinnatti Bell-Hangers' Bits..... 30¢

Bit Stock Drills—

Morse Twist Drills..... 50¢
Standard..... 50¢
Cleveland..... 50¢
Syracuse, for metal..... 50¢
Syracuse, for wood (wood list)..... 30¢
Cincinnati, for metal..... 30¢
Cincinnati, for metal..... 45¢

Expansive Bits—

Clark's small, \$18; large, \$20..... 35¢
Ives' No. 4, \$ dos..... 40¢
Swan's..... 40¢
Stearns, No. 1, \$20; No. 2, \$22..... 40¢
Stearns' No. 2, \$48..... 20¢

Gimlet Bits—

Common..... \$ gross \$2.75, \$3.25
Diamond..... \$ dos \$1.10..... 25¢
See..... 25¢
Double Cut, Shepherdson's..... 45¢
Double Cut, Ct. Valley Mfg. Co..... 30¢
Double Cut, Hartwell's, \$ gro..... 55¢
Double Cut, Douglas's..... 40¢
Double Cut, Ives'..... 60¢

Hollow Augers—

Ives..... 35¢
French, Swift & Co..... 35¢
Douglas's..... 35¢
Bonney's Adjustable, \$ dos..... 40¢
Stearns..... 20¢
Ives' Expansive, each \$4.50..... 50¢
Universal Expansive, each \$4.50..... 20¢
Wood's..... 25¢
Cincinnati Adjustable..... 25¢
Cincinnati Standard..... 25¢

Ship Augers and Bits—

L'Hommiedieu's..... 15¢
Watrous's..... 15¢
Snell's..... 15¢
Snell's Ship Auger Pat'n Car Bits..... 15¢

Awl Hafts—See Hafts, Awl.

Awls—

Awls, Sewing, Common..... \$ gr 5¢, 10¢
Awls, Should, Peg..... \$ gr 1.50, 2.55
Awls, Pat. Peg..... \$ gr 3.50, 4.50
Awls, Shouldered Brad..... \$ gr 1.30, 1.40
Awls, Handled Brad..... \$ gr 2.25, 3.00
Awls, Handled Scratch..... \$ gr 4.00, 4.50
Awls, Socket Scratch..... \$ dos, \$1.10, \$1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First quality, best brands, \$7.00 @ \$7.50
First qual., other brands..... 6.75
Second quality..... 6.00

Axle Grease—See Grease, Axle.

Axles—

No. 1, 3¢ (4¢, No. 2, 5¢)..... 3¢
Nos. 7 to 14..... 2¢
Nos. 15 to 22..... 1¢
Nos. 19 to 22..... 70¢
Concord Axles, loose collar..... 4¢
Concord Axles, solid collar..... 5¢
National Tubular Self-Oiling..... 33¢

Bag Holders.—See Holders, Bag.

Balances—

Spring Balances..... 40¢
No. 2000..... 30¢
Chatillon, \$ dos..... 8¢
Chatillon Straight Balances..... 40¢
Chatillon Circular Balances..... 50¢

Barb Wire.—See Wire, Barb.

Bars.

Cast Steel..... \$ 35¢
Iron, Steel Points..... \$ 35¢

Basins, Wash—

Standard Fiberglass, No. 1, 10½-inch, \$2; 12-inch, \$2.25; 13½-inch, \$2.75; 16-inch, \$3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '82..... 50¢
Chatillon's No. 1..... 40¢
Chatillon's No. 2..... 50¢
Custer's..... 35¢

Beaters—

Dove..... \$ dos \$1.50
Duplex Standard Co..... \$ dos \$1.25
Rival (Standard Co.)..... \$ dos \$1.00
Duplex Extra Heavy (Standard Co.)..... \$ dos \$3.60

Bentons—

Bryant's..... \$ gro \$14.00
Double (H. & R. Mfg. Co.), \$ gro, No. 0, \$12.00; No. 1, \$16.00; No. 2, \$20.00
Kasy (H. & R. Mfg. Co.)..... \$ gro \$12.00
Triple (H. & R. Mfg. Co.)..... \$ gro \$16.50
Spiral..... \$ gro \$4.25 @ 4.50
Improved Acme (H. & R. Mfg. Co.)..... \$ gro \$9.00

Belts, Diehl & Co.'s—

Palme & Co..... \$ dos \$24.00
Culinary..... \$ dos \$6.50
Keystone, P.D. & Co., Each, No. 1, \$1; No. 2, \$2..... 20¢

Bells—

Common Wrought..... 60¢
Western, Sargent's list..... 70¢
Kentucky, Star..... 20¢
Kentucky, Sargent's list..... 70¢
Kentucky Durham..... 70¢
Dodge, Genuine Kentucky..... 70¢
Texas Star..... 50¢

Door—

Gong, Abbe's..... 35¢
Gong, Yankee..... 45¢
Gong, Barton's..... 40¢
Crane, Taylor's..... 25¢
Crane, Brooks'..... 50¢
Crane, Cone's..... 10¢
Crane, Connel's..... 20¢
Lever, Sargent's..... 60¢
Lever, Taylor's, Bronzed or Plated..... 60¢
Lever, R. E. M. Co.'s..... 60¢
Pull, Brook's..... 50¢

Electric—

Wellenak's..... 20¢
Bigelow & Dowse..... 20¢
Taylor's..... 20¢

Head—

Light Brass..... 70¢
Extra Heavy..... 70¢
White..... 70¢
Silver Chime..... 35¢
Globe Cone's Patent..... 35¢

Miscellaneous—

Call..... 40¢
Farm Bells..... 35¢
Steel Alloy Church and School Bells..... 40¢

Bellows—

Blacksmiths..... 60¢
Molders..... 40¢
Hand Bellows..... 40¢

Belting, Rubber—

Common Standard..... 70¢
Standard..... 70¢
Extra..... 60¢
N.Y.B. & P. Co., Carbon..... 60¢
N.Y.B. & P. Co., Diamond..... 60¢
N.Y.B. & P. Co., Para..... 40¢

Bench Stops—See Stops, Bench.

Benders and Upsetters, Tire.

Stoddard's Lightning Tire Upsetters..... 15¢
Detroit Perfected Tire Bender..... 15¢

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters.

Blind Fasteners—See Fasteners.

Blind Staples—See Staples, Blind.

Blocks—

Ordinary Tackle, list May 30, 1890..... See Trade Report

Cleveland Block Co., Mat. Iron..... 50¢
Moore's Novelty, Mat. Iron..... 50¢
Sure Grip Steel Tackle Blocks..... 25¢

Boards, Mvve.

Wood Lined Crystal..... 45¢
Oxidized..... 45¢
Embossed..... 50¢
Paper Lined Zinc..... 50¢
Crystal..... 50¢
Embossed..... 50¢
New Tacoma..... 55¢

Boils—

Carriage, Machine, &c..... 75¢
Com. list June 10, '84..... 75¢
Genuine Eagle, Norway, list Oct., '84..... 75¢
Phila. pattern, list Oct. 7, '84..... 75¢
R.B. & W., old list..... 70¢
Machine, list Jan. 1, 1890..... 80¢

Bolt Ends, list Jan. 1, 1890.....

80¢

Door and Shutter—

Cast Iron Barrel, Square, &c..... 70¢
Cast Iron Shutter Bolts..... 70¢
Cast Iron Chain (Sargent's list)..... 65¢
Ives' Patent Door Bolts..... 60¢
Wrought Barrel..... 70¢
Wrought Square..... 70¢
Wrt Shutter, all Iron, Stanley's..... 60¢
Wrt Shutter, Brass Knob..... 40¢
Wrt Shutter, Sargent's list..... 60¢
Wrt Sunk Flush, Sargent's list..... 55¢
Wrt Sunk Flush, Stanley's list..... 60¢
Wrt B.K. Flush, Com'n..... 55¢

Stove and Plow—

Stove..... 60¢
Plow..... 60¢
R. B. & W., Plow..... 55¢

Tire—

Common, list Feb. 28, '83..... 65¢
Port Chester Bolt and Nut Company..... 65¢
Empire, list Feb. 28, '83..... 65¢
Keystone, Philadel., list Oct. '84..... 75¢
Norway, Phila., list Oct. '84..... 75¢
American Screw Company..... 75¢
Norway, Phil., list Oct. 16, '84..... 75¢
Eagle, Phil., list Oct. 16, '84..... 80¢
Philadel., list Oct. 16, '84..... 80¢
Bay State, list Feb. 28, '83..... 65¢
R.B. & W., Philadel., list Oct. 16, '84..... 80¢

Borers, Tap.

Common and Ring..... 30¢
Ives' Tap Borer..... 35¢
Enterprise Mfg. Co..... 30¢
Clark's..... 35¢

Borax—

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Bowes, Wagon.

Per \$..... 25¢

Braces—

American Bit Brace Co.:
Nos. 10, 12, 20..... 60¢
Nos. 11, 21, 24, 27..... 70¢
Nos. 22, 23, 25..... 60¢
Nos. 13, 26, 28, 37..... 70¢
Ball Braces, net..... \$1.12 to \$1.25

Amidon's—

Barker's Imp'd Plain..... 75¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢

Barber's—

Nos. 10 to 16..... 50¢
Nos. 30 to 33..... 60¢
Nos. 40 to 63..... 60¢

Saxton's—

Barker's Imp. Polished..... 75¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢
Barker's Imp. Nickel..... 65¢

Bartholomew's—

Nos. 25, 27 and 30..... 60¢
Nos. 117, 118, 119..... 70¢
Common Ball, American..... \$1.00 @ \$1.10
Pray's Genuine Spofford's..... 60¢
Pray's No. 70 to 130, 81 to 123, 207 to 414..... 60¢

Ives' New Haven Novelty—

New Haven Ratchet..... 60¢
Barber Ratchet..... 60¢
Barber's..... 60¢
Spofford..... 60¢
Osgood's Ratchet..... 60¢
P. S. & W. Co., Peck's Patent..... 60¢

Brackets—

Shelf, plain..... 65¢
Regular list..... 65¢
Shelf, fancy..... 65¢
Sargent's list..... 65¢
Other makes at a wide range of prices.

Bright Wire Goods—See Wire.

Brass—

Hend's Self-Inch..... 9 10 9x11
Basting..... \$4.50 5.50 6.50
New Haven..... 60¢
Wire Goods Co..... 60¢
Morgan Odorless..... \$ dos \$12, 35¢

Buckets, Well.

Galvanized—
Hill's..... \$ dos, 12 qt, \$4.25; 14 qt, \$5.25
Iron Clad..... \$ dos, 14 qt, \$4.25 @ \$4.50
Burg's Flat Iron Band..... \$3.75
Helwig's Wired Top..... \$ dos \$4.00

Bull Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers.

Butchers'—

Butchers'..... 75¢

Butts—

Brass—
Wrought Brass..... 60¢
Cast Brass, Tiebout's..... 60¢
Cast Brass, Fast..... 35¢
Cast Brass, Loose Joint..... 35¢

Cast Iron—

Fast Joint, Narrow..... 50¢
Fast Joint, Broad..... 50¢
Loose Joint..... 50¢
Loose Joint, Japaned..... 50¢
Loose Joint, Jap. with Acorns..... 50¢
Parliament Butts..... 70¢
Butter's Hinges..... 75¢
Loose Pin, Acorns..... 75¢
Loose Pin, Acorns, Japaned..... 75¢
Loose Pin, Acorns, Japaned, Plated Tips..... 75¢

Wrought Steel—

Fast Joint, Narrow..... 70¢
Fast Joint, L. Narrow..... 70¢
Fast Joint, Broad..... 70¢
Loose Joint, Broad..... 70¢
Table Butts, Back Flaps, &c..... 75¢
Inside Blind, Regular..... 75¢
Inside Blind, Light..... 75¢
Loose Pin..... 75¢

Calipers—See Compasses.

Calks, Tee—

Gautier, One Prong, Blunt..... 5¢
Burke's, One Prong, Blunt..... 5¢
Burke's, Two Prong, Blunt..... 5¢
Burke's, One Prong, Sharp..... 5¢

Can Openers—See Openers, Can.

Caps—

Percussion, W 1000—
Ticks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's..... 35¢
E. B. Trimmed Edge, 1-10's..... 47¢
E. B. Grnd. Edge, Cent. Fire, 1-10's..... 47¢

Musket Waterproof, 1-10's..... 50¢
G. D..... 27¢
I. B. Genuine Import..... 25¢
Eley's E. B..... 25¢
Eley's D Waterproof, Central Fire..... 15¢

Primers—

Gordan Primers, \$1.00..... 25¢
S. L. Caps (for Sturtevant Shells) \$1.00..... 25¢
All other Primers, \$1.30..... 25¢

Cards—List January 28, 1891.

Watson's Cotton, Wool, Horse and File..... 35¢

Carpet Stretchers—See Stretchers.

Carpet Sweepers—See Sweepers.

Cartridges—

4m Fire Cartridges..... 50¢
4m Fire Military..... 15¢
Cent. Fire, Pistol and Rifle..... 25¢
Cent. Fire, Military and Sporting..... 15¢

Blank Cartridges, except 22 and 32 cal., additional 10¢ on above discounts.
Blank Cartridges, 22 cal., \$1.75..... 25¢
Blank Cartridges, 32 cal., \$3.50..... 25¢
Primed Shells and Bullets..... 25¢
S. B. Caps, Round Ball, \$1.75..... 25¢
S. B. Caps, Con. Ball, 8wdg., \$3.00..... 25¢

Casters—

Bed..... 55¢
Shallow Sockets..... 60¢
Deep Sockets..... 40¢
Yale Casters, list May, 1884..... 30¢
Yale, Gem..... 60¢
Martin's Patent (Phoenix)..... 45¢
Payson's Anti-Friction..... 70¢
Payson's Truck..... 30¢
Giant Truck Casters..... 60¢
Stationary Truck Casters..... 50¢
Socket Truck Casters..... 50¢

Cattle Leaders—See Leaders, Cattle.

Cement.

Victor Elastic..... 5¢

Chain—

Trace, Wagon and Fancy Chains, list revised April 21, 1890..... 60¢
American Coil, in case lots,
3-16 1/4 5-16 3/4 7-16 1/2 9-16 3/4 11-16 1/2 13-16 3/4 15-16 1/2 17-16 3/4 19-16 1/2 21-16 3/4 23-16 1/2 25-16 3/4 27-16 1/2 29-16 3/4 31-16 1/2 33-16 3/4 35-16 1/2 37-16 3/4 39-16 1/2 41-16 3/4 43-16 1/2 45-16 3/4 47-16 1/2 49-16 3/4 51-16 1/2 53-16 3/4 55-16 1/2 57-16 3/4 59-16 1/2 61-16 3/4 63-16 1/2 65-16 3/4 67-16 1/2 69-16 3/4 71-16 1/2 73-16 3/4 75-16 1/2 77-16 3/4 79-16 1/2 81-16 3/4 83-16 1/2 85-16 3/4 87-16 1/2 89-16 3/4 91-16 1/2 93-16 3/4 95-16 1/2 97-16 3/4 99-16 1/2 101-16 3/4 103-16 1/2 105-16 3/4 107-16 1/2 109-16 3/4 111-16 1/2 113-16 3/4 115-16 1/2 117-16 3/4 119-16 1/2 121-16 3/4 123-16 1/2 125-16 3/4 127-16 1/2 129-16 3/4 131-16 1/2 133-16 3/4 135-16 1/2 137-16 3/4 139-16 1/2 141-16 3/4 143-16 1/2 145-16 3/4 147-16 1/2 149-16 3/4 151-16 1/2 153-16 3/4 155-16 1/2 157-16 3/4 159-16 1/2 161-16 3/4 163-16 1/2 165-16 3/4 167-16 1/2 169-16 3/4 171-16 1/2 173-16 3/4 175-16 1/2 177-16 3/4 179-16 1/2 181-16 3/4 183-16 1/2 185-16 3/4 187-16 1/2 189-16 3/4 191-16 1/2 193-16 3/4 195-16 1/2 197-16 3/4 199-16 1/2 201-16 3/4 203-16 1/2 205-16 3/4 207-16 1/2 209-16 3/4 211-1

Maltese.
Hickory.....30x10@30x10x10
Lignumvite.....30x10@30x10x10
B. & L. Block Co., Hickory & L. V.
30x10@30x10x10

Mattresses, Regular list.
60x10@60x10x25

Measures—
Standard Fiberglass, No. 1, peck, 7
dosen, \$4; 1/2 peck, \$3.50.
Meat Cutters—See Cutters, Meat.
Menders, Harness—
For dos.....\$2.00

Mills.
Coffee
Box and Side, List Jan. 1, 1888, 60x60x10x
Net prices are often made which are
lower than above discount. Co. 30x10x30x
American, Enterprise Mfg. Co. 30x10x30x
The Swift, Lane Bros.....30x10x30x

**Miscellaneous Knives—See Knives,
Mining.**
Molasses (Gates—See Gates, Mo-
lasses.)
Money Drawers—See Drawers, Mo-
ney.
Mowers, Lawn.
Pennsylvania, New Model, Excelsior,
Continental, &c.....60x10x30x
Philadelphia.....60x10x30x
Perfection.....60x10x30x
Easy.....60x10x30x
Bay State.....60x10x30x
Other Machines.....60x10x30x

Muzzles—
Safety.....\$3.00, 25 x

Nails.
Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15, '89, 76x10@80x
Tack Mfrs' list.....70x10@10x
Wire Nails, Standard Penny.
Card June 1 '89 base.....\$1.95 @ \$2.00

Horse—
Nos. 6 7 8 9 10
Ausable.....28x26x25x24x23x
Clinton, Pin. 17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
Exeter.....28x26x25x24x23x
Lyra.....19x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
Snowden.....19x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
Putnam.....23x21x20x19x18x
1000 lb in year 15x
Fulcan.....33x31x30x29x28x27x26x25x24x23x22x21x20x19x18x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
Northwest.....23x22x21x20x19x18x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
A. C.....25x23x22x21x20x19x18x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
C. B. E.....25x23x22x21x20x19x18x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
Maud S.....25x23x22x21x20x19x18x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
Champion.....28x26x25x24x23x22x21x20x19x18x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
Saranac.....23x21x20x19x18x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
Champion.....25x23x22x21x20x19x18x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
Capewell.....19x18x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
Anchore.....23x21x20x19x18x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
Western.....23x21x20x19x18x17x16x15x14x13x12x11x10x9x8x7x6x5x4x3x2x1x
Empire Bronzed.....14 x

Picture—
Brass Head, Sargent's list.....50x10x10x
Brass Head, Combination list.....50x10x10x
Porcelain Head, Sargent's list.....50x10x10x
Porcelain Head, Combination list.....50x10x10x
Wiles' Patent.....40x
Nail Pullers—See Pullers, Nail.
Nail Sets—See Sets, Nail.
Nut Crackers—See Crackers, Nut.
Nuts—List Dec. 18, 1889.
Squares, Hex.
Hot Pressed.....4.50x 5.50x off list.
Cold Punched.....5.00x 5.10x off list.
In packages of 100 lb, add 1-10¢ x
net; in packages less than 100 lb, add
1/4¢ x, net.

Oakum—
Best or Government.....\$ 7 7 7 1/4
U. S. Navy.....\$ 6 6 6 1/4
Navy.....\$ 5 5 5 1/4

Oilers—
Zinc and Tin.....65x10x70x5x
Brass and Copper.....60x10x50x10x5x
Malleable, Hammer, Improved, No. 1,
\$3.00; No. 2, \$4.00; No. 3, \$4.50 x
10x10x5x
Malleable, Hammers, Old Pattern, same
list.....40x
Prior's Pat. or "Paragon" Zinc.....60x10x10x
Olmstead's Tin and Zinc.....50x
Olmstead's Brass and Copper.....50x
Broughton's Zinc.....50x
Broughton's Brass.....50x
Sam P. D. & Co.....\$ gro. 32
Steel, Draper and Williams.....50x

Openers, Can.
Hessinger's Comet.....\$ dos \$3.00, 25x
Duplex.....\$ gross \$2.75 @ \$3.00
Lyman's.....\$ dos \$3.75, 30x
No. 4 French.....\$ dos \$2.25, 55x
No. 5, Iron Handle.....\$ gr \$6.00, 45x
Saxe.....\$ dos \$2.50, 10x
Saxine Scissors.....\$ dos \$3.75 @ \$3.00
Star.....\$ dos \$2.75, 3x
Sprague, No. 1, \$2.00 2, \$2.25 3, \$2.50
50x10x10x
Excelsior No. 1 \$2.50; No. 2, \$1.50.....40x
Russia's Best.....\$ gross, No. 1, \$12.00
No. 2, \$24.00; No. 3, \$36.00.....60x10x
Universal.....\$ dos \$3.00, 15x
Domestic.....\$ dos \$2.00, 15x
Champion.....\$ dos \$3.00, 15x

Packing, Steam—
Rubber
Standard.....60x5@65x
Extra.....60x5@65x
N. Y. B. & P. Co., Standard.....50x
N. Y. B. & P. Co., Empire.....60x
N. Y. B. & P. Co., Salamander.....25x
Jenkins' Standard.....\$ 80x, 25x@25x5x

Miscellaneous—
American Packing.....10x@11x
Russia Packing.....15x@14x
Italian Packing.....15x@14x
Cotton Packing.....15x@14x
Jute.....7x@8x

Falls.
Galvanized Iron—
Quarts 10 12 14
Hill's Light Weight, \$ dos. \$3.75 3.00 3.25
Hill's Heavy Weight, \$ do. 3.00 3.25 3.75
Holwig's.....2.50 2.75 3.00
Sidney Shepard & Co.....2.25 2.55 3.00
Iron Clad.....2.50 2.75 3.00
Fire Buckets.....2.75 3.25 3.50
Buckets, see Well Buckets.
Indurated Fibre Ware—25x
Star Pails, 12 qt., per doz.....\$ dos \$5.40
Stable and Milk, 14 qt.....\$ dos \$6.00
Fire Pails, deep.....\$ dos \$5.40
round bottom.....\$ dos \$7.80

Standard Fibre Ware—
Plain, Deer'd
Water Pails, 12 qt., per doz.....\$4.00 4.50
Dairy Pails, 14 qt., per doz.....4.50 5.00
Fire Pails, No. 1, 12 qt. per doz.....4.50
Fire Pails, No. 2, 14 qt. per doz.....5.00
Sugar Pails.....6.00 6.50
Horse Pails.....8.00
Buggy Pails.....4.00
Slop Pail (bal. trap).....8.00 9.00
Chamber Pails, 14 qt.....6.50 7.50

Pans.
Dripping.
Small sizes.....\$ 2 6 1/4
Large sizes.....\$ 2 6 1/4
Silver & Co. (Covered).....40x

Fry—
Standard List:
No. 0 1 2 3 4
\$ dos. \$3.00 \$3.75 \$4.25 \$4.75 \$5.25
No. 5 6 7 8
\$ dos.....\$6.00 \$7.00 \$7.00 \$8.00
Polished, regular goods.....75x@75x10x
Acme Fry Pans.....80x10x

Dust—
Steel Edge, No. 1.....\$ dos \$1.75

Paper and Cloth—
Sand and Emery—
List April 19, 1886.....50x@50x10x
Sibley's Emery and Crocus Cloth.....30x

Parers.
Apple.
Advance.....\$ dos \$4.75
Baldwin.....\$ dos 5.25
Bonanza.....\$ dos 6.00
Daisy.....\$ dos 4.00
Dandy.....\$ each 7.50
Eclipse.....\$ dos 4.25
Eureka, 1888.....\$ each 16.00
Family Bay State.....\$ dos 12.00
Favorite.....\$ dos 4.00
Gold Medal.....\$ dos 4.00
Ideal.....\$ dos 4.00
Improved Bay State.....\$ dos \$7.00 @ \$8.00
Little Star.....\$ dos 4.50
Monarch.....\$ dos 13.50
New Lightning.....\$ dos 5.50
Coke.....\$ dos 4.00
Penn Mountain.....\$ dos 4.00
Perfection.....\$ dos 4.00
Pomona.....\$ dos 4.00
Rocking Table.....\$ dos 6.00
Turn Table.....\$ dos 4.50
Victor.....\$ dos 13.50
Viceroy.....\$ dos 4.00
White Mountain.....\$ dos 4.00
73.....\$ dos 4.25
78.....\$ dos 4.25

Potato—
White Mountain.....\$ dos \$4.50
Anticombination.....\$ dos \$5.50
Hoosier.....\$ dos \$13.50
Saragosa.....\$ dos \$5.50

Penells—
Faber's Carpenters'.....high list 50x
Faber's Round Gilt.....\$ dos \$5.25
Dixon's Lead.....\$ gro \$4.50
Dixon's Lumber.....\$ gro \$6.75
Dixon's Carpenters'.....10x

Picks—
Railroad or Adas Eye, 5 to 6, \$12.00;
6 to 7, \$11.00.....60x10x60x10x5x

Picture Nails.—See Nails, Picture.
Pinking Irons.—See Irons, Pinking.
Pins.
Humason, Beckley & Co's.....60x10x
Sargent & Co's.....\$17 and \$18.....60x10x
Peck, Stow & W Co.....50x10x50x10x5x

Curtain—
Silvered Glass.....net
White Enamel.....net

Iron, list Nov. 11, 1885.....60x10x50x10x5x
Brass.....60x60x25x

Pipe, Wrought Iron—
List September 18, 1889.
1 1/2 and under, Plain.....57x@60x
1 1/2 and under, Galvanized.....47x@51x
1 1/2 and over, Plain.....67x@70x
1 1/2 and over, Galvanized.....55x@74x
Boiler Pipe up to 3 1/2 in. inclusive.....55x
Sizes 3 in. and larger.....65x
Casing.....55x
Inserted Joints Casing.....60x
Steel Boiler Tubes.....30x

Planes and Plane Irons—
Wood Planes—
Molding.....40x10x
Bench, First Quality.....50x10x
Bench, Second Quality.....55x10x
Bailey's (Stanley R. & L. Co.).....50x10x

Iron Planes—
Bailey's (Stanley R. & L. Co.).....50x10x
Miscellaneous Planes (Stanley R. & L. Co.).....25x10x
Steel's Iron Planes.....35x@36x10x
Meriden Mal. Iron Co's.....40x40x10x
Davis's Iron Planes.....40x40x10x
Birmingham Plane Co.....50x50x10x
Gage Tool Co's Self-Setting.....30x10x10x
Chaplin's Iron Planes.....40x40x10x
Sargent's.....50x10x30x10x10x
Standard Tool Co.....50x50x5x

Plane Irons—
Butcher's.....\$5.00 @ \$6.25 to 6
Buck Bros.....30x
Auburn "Thistle".....30x10x
Ohio.....30x10x
Sandy.....25x
S. & J. White.....25x
Stanley R. & L. Co.....50x10x

Plates.
Fellows.....\$ 2 6 1/4 @ 2 6 1/4

Pliers.
Button's Patent.....50x@50x10x
Hart's No. 2, 5 in., \$13.50; No. 4, 7 in.,
\$21.00; No. 6, 9 in., \$24.00.....50x10x
Humason & Beckley Mfg. Co., 50x50x10x
Lindsay's Giant.....40x
Gas Pliers.....40x

Gas Pliers, Custer's Nickel Plated.....60x5x
Eureka Pliers and Nippers.....40x
Russell's Parallel.....25x
P. S. & W. Cast Steel.....60x
P. S. & W. Tinner's Cutting Nippers,
add 6¢ dis 10x
Carew's Pat. Wire Cutters.....30x
Morrell's Parallel, \$ dos, \$12.00.....30x5x
Cronk's 5 in., \$15.00; 10 in. \$21.00.....50x50x5x
Cronk's Button Pat. Iron.....50x10x40x
Cronk's Carrier Pliers.....60x60x5x

Plumbers and Levels—
Regular List.....75x10x75x10x5x
Stanley's Duplex.....20x10x
Stanley's Handy.....40x10x
Pocket Level.....7x10x70x10x10x
Davis Iron Levels.....30x
Davis' Inclinoimeters.....10x10x

Pouchers.
Egg.
Buffalo Steam Egg Pouchers, \$ dos, No.
1, \$4.00; No. 2, \$3.00.....25x
Silver & Co., 6-Ring, \$ dos \$4; 3-Ring \$3

Pokes, Animal—
Bishop's O. K.....\$ dos \$6.00
Bishop's O. K.....\$ dos \$5.25
Bishop's Pioneer.....\$ dos \$3.75
Bishop's American.....\$ dos \$2.75
Eagle, Double Stale.....\$ dos \$5.75
Eagle, Single Stale.....\$ dos \$3.75
Buckeye, Single Stale.....\$ dos \$2.75

Police Goods.
R. I. Tool Co., Handcuffs, \$15.00 \$ dos 10x
R. I. Tool Co., Leg Irons, \$25.00 \$ dos 10x
Towler's.....25x
Daley's Improved Handcuffs: 2 Hands,
Polished, \$ dos \$48.00; Nickel, \$
\$57.00; 3 Hands, Polished, \$ dos
\$72.00; Nickel, \$84.00.....25x
J. P. Lovell's Police Goods.....25x

Polish, Metal.
Prestolite.....30x
Prestolite Paste and Oil.....33x4x
Gaston's Silver Compound.....33x4x

Polish, Stove.
Joseph Dixon's.....\$ gro \$6.00, 10x
Gem.....\$ gro \$4.50, 10x
Gold Medal.....\$ gro \$6.00, 25x
Mirror.....\$ gro \$6.00, 10x
Lustro.....\$ gro \$4.75
Rising Sun, 5 gro lots.....\$ gro \$5.50
Dixon's Plumbago.....\$ 8x
Boynton's Noon Day, \$ gro.....13.00
Parlor Pride Stove Enamel.....\$ gro
Yates' Liquid, 2 3 8 10 gal.....
\$ gal.....\$60.70 60 50
Yates Standard Paste Polish, 10-b cans,
\$ 12x
Jet Black.....\$ gro \$3.50
Japanese.....\$ gro \$3.50
Firestone.....\$ gro \$2.50
Diamond O. K. Enamel.....\$ gro \$19.00
Bonnell's Liquid Stove Polish.....\$ gro \$9.00
Bonnell's Paste Stove Polish.....\$ gro \$6.00
Black Eagle Benzine Paste, 5 and 10 b
cans.....13x4x
Black Jack Water Paste, 5 and 10 b
cans.....12x4x
Nickel Plate Paste.....\$ gro \$6.00
Crown Paste.....\$ gro \$7.20
Crown Paste, in 5 and 10 b pails \$ 12x
Black Flag.....\$ gross, \$7.20
Black Flag, 5 and 10 b pails.....\$ 12x
Black Flag, Liquid, in bottles, \$ gro, \$8.00
Diamond Rock Nickel Cleaner.....\$ gro
10.20

Peppers, Corn—
Round or Square, 1 qt., \$ gr \$10.00 @ 10.50
Round or Square, 1 1/2 qt., \$ gr \$15.00 @ 15.50
Round or Square, 3 qt., \$ gr \$18.50 @ 19.00

**Post Hole and Tree Augers
and Diggers—See Diggers, Post
Hole, &c.**
Potato Parers—See Parers, Potato.
Pots.
Gine—
Tinned.....40x10x40x10x5x
Enamelled.....40x10x40x10x5x
Family, Howe's "Eureka".....40x
Family, L. F. C.'s "Handy".....50x

Presses.
Fruit and Jelly—
Enterprise Mfg. Co.....20x10x30x
Henis.....\$ dos \$3.50
Shepard's, Union City.....40x
Silver & Co.....\$ dos \$2.75

Pruning Hooks and Shears—
See Shears.
Pullers.
Nail.
Scranton.....\$ dos \$18.00, 33x4x
Curtis Hammer.....\$ dos \$9.00
Giant, No. 1.....\$ dos \$13.00, 10x
Giant, No. 2.....\$ dos \$15.00, 10x
Pelican.....\$ dos \$8.00, 25x
Eclipse.....\$ each, \$3.00 net

Pulley—
Hot House, Awning, &c.....60x10x
Japanned Screw.....60x10x
Brass Screw.....60x10x
Japanned Screw.....60x10x
Japanese Clothes Line.....60x10x
Empire Sash Pulley.....55x60x
Moore's Sash, Anti-Friction.....60x
Hay Fork, Solid Eye, \$4.00; Swivel,
\$4.50.....50x10x50x10x5x
Hay Fork, "Anti-Friction," 5 in. Solid,
\$5.70.....50x
Hay Fork.....\$ 7x Common and Pat.
Bushed.....30x
Hay Fork, Tarbox Pat. Iron.....20x
Hay Fork, Reed's Self-Lubricating.....60x
Shade Rack.....45x
Tackle Blocks.....See Hooks
Moore's Anti-Friction 5 in. Wheel, \$ dos
\$12.00.....40x

Pumps.
Clatren, Best Makers.....60x60x10x
Pitcher Spout, Best Makers.....67x@70x
Pitcher Spout, Chesaper G'ds.....75x@78x10x

Punches.
Saddler's Drive, good, \$ dos.....60x5x
Bemis & Call Co's Cast Steel Drive.....60x5x
Bemis & Call Co's Springfield Socket.....50x5x
Spring, good quality.....\$ dos \$3.50 @ 2.00
Leach, Spring's Pat.....15x
Bemis & Call Co's Spring and Check.....40x
Solid Tinner's P. S. & W. Co. \$ dos \$3.25
Tinner's Hollow Punches P. S. & W. Co. \$ dos \$3.25
Rice Hand 1 inches.....15x
Avery's Revolving.....40x
Avery's Saw-Set and Punch. See Saw Sets.

Rail.
Sliding Door, Wrt Brass, \$ 35x.....15x
Sliding Door, Bronzed Wrt Iron, \$ ft. 7x
Sliding Door, Iron, Painted, \$ foot 4x, 40x
Barn Door, Light In.....\$ 4x
Per 100 feet.....\$2.00 2.50 3.10, 10x

Rakes.
Cast Steel, Association goods.....60x@70x
Cast Steel, outside goods.....30x10x10x70x5x

Malleable.
Gibbs Lawn Rake.....\$ dos \$1.90
Canton Lawn Rake.....\$ dos \$3.75
Favorite Lawn Rake.....\$ dos \$4.40
Fort Madison Steel Tooth Lawn Rake.....\$60.00.....25x

Razors.
J. R. Torrey Razor Co.....30x
Wostenholme and Butcher, \$10 to \$.....10x
Jordan's A.A.I., new list.....net
Jordan's Old Faithful, new list.....net
Galvanic.....\$ dos \$15.00

Razor Straps—See Straps, Razor.
Rings and Ringers.
Bull Rings—
Union Nut Co.....60x10x70x25x
Hotchkiss' low list.....\$ dos \$1.50
Humason, Beckley & Co's.....50x10x50x10x10x
Peck, Stow & W. Co's.....50x10x50x10x10x
Elrich Hdw. Co., White Metal, low list,
60x20x10x

Hog—
Top of the Hill Ringers.....\$ dos \$2.00
Top of the Hill Ringers.....\$ dos \$1.50
Hill's Improved Ringers.....\$ dos \$1.25
Hill's Old Style Ringers.....\$ dos \$1.12x
Hill's Tons.....\$ dos \$2.00
Hill's Rings.....\$ dos \$1.00
Perfect Rings.....\$ dos \$1.50
Perfect Rings.....\$ dos \$1.50
Blair's Hog Ringers.....\$ dos \$2.00
Blair's Hog Ringers.....\$ dos \$2.00
Champion Ringers.....\$ dos \$2.00
Champion Ringers, Double.....\$ dos \$2.25
Brown's Ringers.....\$ dos \$2.00
Brown's Ringers.....\$ dos \$1.50 @ 1.50
Electric Hog Ringers.....\$ dos \$2.00
Major Rings.....\$ dos \$1.25
Major Ringers.....\$ dos \$2.00

Rivets and Hurrs—
Iron, list Nov. 17, '87.....40x
Copper.....60x10x60x10x5x
Coppered Iron, Best Brand.....40x

Rivet Sets—See Sets.
Rods.
Stair, Brass.....25x3x
Stair, Black Walnut.....\$ dos 40x

Rollers.
Barn Door, Sargent's list.....60x10x10x
Acme Moore's Anti-Friction.....55x
Union Barn Door Roller.....70x

Rope.
Manila, 7-16 in. diam. and larger \$ 12x4x
Manila.....\$ 12x4x
Manila.....\$ 12x4x
Manila Tarred Rope.....\$ 12x4x
Manila Hay Rope.....\$ 12x4x
Manila.....7-16 inch and larger \$ 10x4x
Sisal.....\$ 10x4x
Sisal.....\$ 10x4x
Sisal Hay Rope.....\$ 10x4x
Sisal, Tarred Rope.....\$ 9x4x
Sisal, Medium Lath Yarn.....\$ 9x4x
New Zealand.....16 in. \$ 9x4x
New Zealand.....14 inch, \$ 9x4x
New Zealand, 14 and 16 inch.....\$ 9x4x
New Zealand, Hay Rope.....\$ 8x4x
New Zealand, Tarred Rope.....\$ 8x4x

**Note.—Manufacturers' prices on above
1¢ less, f.o.b. factory—less 1 1/4¢ for
cash.**
Cotton Rope.....\$ 13x4x16x
Jute Rope.....\$ 8x4x7x

Wire.
List February, 1892.
A 1 kinds.....45x

Rules.
Boxwood.....80x10x10x
Ivory.....50x60x10x
Starrett's Rules and Straight Edges,
Steel.....25x10x

Sad Irons—See Irons, Sad.
Sand and Emery Paper and
Cloth—See Paper and Cloth, Sand
and Emery
Sash Cord—See Cord, Sash.
Sash Locks—See Locks, Sash.
Sash Weights—See Weights, Sash.
Sausage Stuffers or Fillers—
See Stuffers or Fillers, Sausage.
Saws—The following prices are
often cut by jobbers.
Dixson's Circular.....45x45x5x
Dixson's Cross Cuts.....45x45x5x
Dixson's Hand.....30x20x5x
Woodrough & McFarlin.
Hand, Panel and Rip.....25x55x5x
Narrow Champion Cross Cuts with
Handles, \$ foot.....18x30x
Champion Thin Back Cross Cuts, \$
foot.....23x38x
Champion Extra Thin Back Cross
Cuts, \$ foot.....29x31x
One Man Champion Cross Cuts, \$
foot.....37x40x
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip.....\$ 3x55x5x
Narrow Champion Cross Cuts with
Handles, \$ foot.....18x30x
Champion Thin Back Cross Cuts, \$
foot.....23x38x
Champion Extra Thin Back Cross
Cuts, \$ foot.....29x31x
One Man Champion Cross Cuts, \$ ft.,
37x40x

Atkins' Circular Shingle & Heading.....60x
Atkins' Silver Steel Diamond X Cuts.....\$ foot 70x
Atkins' Special Steel Dexter X Cuts.....\$ foot 50x
Atkins' Special Steel Diamond X Cuts.....\$ foot 32x
Atkins' Champion and Electric Tooth
X Cuts.....\$ foot 30x
Atkins' Hollow Back X Cuts.....\$ foot 30x
Atkins' Mulay, Mill and Drag.....40x
Atkins' One-Man Saw, with handles,
\$ foot 40x
Peace Circular and Mill.....45x45x5x
Peace Hand Panel and Rip.....25x55x5x
Peace Cross Cuts.....45x45x5x
Richardson's Circular and Mill.....45x45x5x
Richardson's X Cuts.....45x45x5x
Richardson's Hand, &c.....25x4x
J. E. Jennings & Co., Hand, Panel
and Rip.....25x55x10x

Hack Saws—
 Griffin's, complete.....40¢10¢50¢
 Griffin's Hack Saw, Blades.....40¢10¢50¢
 Star Hack Saws and Blades.....25¢
 Wureka and Crescent.....25¢

Scroll—
 Lester, complete, \$10.00.....25¢
 Rogers, complete, \$4.00.....25¢
 Barnes' Builders' and Cab. Makers' \$15.25¢
 Barnes' Scroll Saw Blades.....35¢

Saw Frames—See Frames, Saw.
Saw Sets—See Sets, Saw.
Saw Tools—See Tools, Saw.

Scales—
 Hatch, Counter, No. 171, good quality.....\$21.00
 Hatch, Tea, No. 161.....\$2.75¢47.00
 Union Platform, Plain.....\$2.00¢2.30
 Union Platform, Striped.....\$2.40¢2.50
 Chatillon's Grocers' Trip Scales.....50¢
 Chatillon's Eureka.....25¢
 Chatillon's Favorite.....40¢
 Family, Turnbulla.....30¢50¢10¢
 Riche Bros., Platform.....40¢

Scale Beams—See Beams, Scale.
Scissors, Fluting.....45¢

Scrapers—
 adjustable Box Scraper (S. R. & L. Co.)
 \$5.50.....\$30¢10¢
 Box, 1 Handle.....\$4.00¢10¢
 Box, 2 Handle.....\$4.00¢10¢
 DeLancey Box and Ship.....\$4.00¢10¢
 Foot.....\$5.00¢10¢
 Ship, Common.....\$3.50¢10¢
 Ship, B. I. Tool Co.....\$4.00¢10¢

**Screen Window and Door
 Frames—See Frames.**
Screw Drivers—See Drivers, Screw.
Screws.
Bench and Hand—
 Bench, Iron.....\$5¢10¢55¢10¢10¢
 Bench, Wood, Beech.....\$2.25¢
 Bench, Wood, Hickory.....20¢10¢
 Hand, Wood.....20¢10¢
 Hand, Grand Rapids, list.....5¢
 Lag, Blunt Point, list Jan. 1, 1890, 75¢10¢
 Coach and Lag, Gimlet Point, list Jan. 1, 1890.....75¢7¢10¢
 Hand Rail, Sargent's.....\$25¢25¢
 Hand Rail, H. & F. Mfg. Co.....70¢10¢75¢
 Hand Rail, Am. Screw Co.....75¢
 Jack Screws, Millers Falls list.....\$50¢50¢
 Jack Screws, P. S. & W.....35¢
 Jack Screws, Sargent.....60¢10¢60¢10¢
 Jack Screws, Stearns.....40¢40¢10¢

Cork—
 Humason & Beckley Mfg. Co.....40¢10¢50¢
 Williamson's.....\$3.94¢35¢
 Howe Bros. & Hulbert.....35¢

Machine—
 Flat Head, Iron.....55¢
 Round Head, Iron.....60¢

Wood—
 List January 1, 1891.
 Flat Head Iron.....75¢
 Round Head Iron.....75¢
 Flat Head Brass.....70¢
 Round Head Brass.....65¢
 Flat Head Bronze.....70¢
 Round Head Bronze.....65¢
 Rogers' Drive Screws.....\$2.45¢
 Extra 10¢ off ten given.

Scroll Saws—See Saws, Scroll.
Scythes.
 Grain.....40¢5¢40¢10¢
 Grass.....40¢10¢50¢

Scythe Snaths—See Snaths, Scythe.
Shells.
Steel and Tool.
 Allen's Sets, Awns and Tools.....55¢10¢
 Gray's Adj. Tool Hds., Nos. 1, 115; 2, 115; 3, 115; 4, 115.....25¢
 Miller's Falls Adj. Tool Hds.....25¢
 Nos. 1, 115; 2, 115.....25¢
 Henry's Combination Hdt.....\$4.50¢
 Stanley's Excelsior.....\$5.50¢
 No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.....\$5.50¢
 Common Vt. Sets.....\$5.50¢
 No. 42, \$10.50; No. 43, \$12.50.....70¢10¢5¢

Nail—
 Square.....\$ gr. \$4.00¢\$4.25
 Round.....\$ gr. \$3.25¢
 Buck Prod.....\$2.75¢
 Cannon's Diamond Point.....\$ gr. \$1.25¢
 Rivet.
 Regular list.....50¢10¢

Saw—
 Stillman's Genuine.....\$ dos \$5.00¢7.75¢
 40¢25¢
 Stillman's Pattern, Hand, \$ dos \$3.25¢
 Cross Cut, 5.25.....45¢60¢
 Common Lever.....\$ dos \$2.00¢4¢50¢
 Morrill's No. 1, \$15.00; Nos. 3&4, \$24.00.....40¢10¢50¢
 Leach's, No. 0, \$3.00; No. 1, \$15, 15¢20¢
 Nash's.....\$0¢10¢20¢10¢10¢
 Hammer, Hotchkiss.....\$5.50¢10¢
 Hammer, Bemis & Call Co.'s new Pat.....\$0¢25¢
 Bemis & Call Co.'s Lever and Spring Hammer.....\$0¢25¢
 Bemis & Call Co.'s Plate.....10¢
 Bemis & Call Co.'s Cross Cut.....12¢4¢
 Alken's Genuine.....\$13.00¢60¢10¢60¢
 Alken's Imitation.....\$7.00¢
 Hart's Pat. Lever.....20¢
 Lionard's Star.....40¢10¢50¢
 Leopold.....40¢10¢50¢
 Atkin's Lever.....\$ dos No. 1, \$6.00
 Atkin's Criterion.....\$ dos No. 1, \$6.00
 Croissant (Keller), No. 1, \$15.00; No. 2, \$24.00.....40¢10¢
 Avery's Saw Set and Punch.....60¢
 Chieftain Co.'s Superior.....\$ dos \$7.00¢
 Chieftain Co.'s Royal.....\$ dos \$7.50¢
 Crescent.....\$ dos \$8.00¢
 Li yd's Acme.....\$ dos \$7.00¢40¢10¢

Sharpeners, Knife.
 Parkins.
 Applewood Handles.....\$ dos \$6.00¢40¢
 Rosewood or Cuckoo a.....\$ dos \$6.00¢40¢

Shaves, Spoke
 Iron.....45¢
 Wood.....50¢
 Bailey's (Stanley R. & L. Co.).....40¢10¢
 Stearns.....50¢10¢
 Cincinnati.....35¢10¢
 Goodell's, \$ dos \$9.00.....25¢

Shears—
 American (Cast) Iron.....75¢10¢75¢10¢5¢
 Barnard's Lamp Trimmers.....\$ dos \$3.75¢
 Tinnern's.....20¢25¢
 Seymour's, list, Dec. 1881.....60¢10¢10¢60¢10¢10¢5¢
 60¢10¢10¢60¢10¢10¢5¢
 Heinisch's, list, Dec. 1881.....60¢10¢10¢60¢10¢10¢5¢
 Heinisch's Tailor's Shears.....35¢4¢
 Cast Steel Trimmers.....80¢80¢10¢
 First quality.....80¢10¢80¢10¢10¢
 Second quality.....80¢10¢80¢10¢10¢
 Acme Cast Shears.....10¢10¢
 Diamond Cast Shears.....10¢
 Clipper.....10¢10¢
 Victor Cast Shears.....75¢10¢75¢10¢5¢
 Howe Bros. & Hulbert, Solid Forged Steel.....40¢
 Chicago Drop Forge & P. Co., Solid Steel Forged.....60¢
 Davenport Cutlery Co.....60¢60¢10¢
 Claus Shear Co., Japaned.....70¢
 Claus Shear Co., Nickel, same list.....60¢
 Galvanic, 3/4 to 9 in, \$ dos \$1.00¢ inch

Pruning Shears and Hooks.
 Diston's Combined Pruning Hook and Saw.....\$ dos \$15.00¢20¢10¢
 Diston's Pruning Hook.....\$ dos \$12.00¢
 20¢10¢
 E. S. Lee & Co.'s Pruning Tools.....40¢
 Pruning Shears, Henry's Pat. \$ dos \$3.75¢40¢
 Henry's Pruning Shears, \$ dos \$4.25¢45¢
 Wheeler, M. & C. Co.'s Combination.....\$ dos \$12.00¢20¢
 Dunlap's Saw and Chisel, \$ dos \$4.60¢30¢
 J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25¢
 P. S. & W. Co.....60¢

Tinners', &c.—
 Shears and Snips (P. S. & W.).....30¢35¢
 Snips, J. Mallinson & Co.....35¢4¢

Sheaves—
Sliding Door—
 M. W. Co., list July, 1888.....60¢10¢60¢5¢
 R. & E. list Dec. 18, 1888.....55¢20¢
 Corbin's list.....60¢10¢25¢
 Patent Roller.....60¢10¢25¢
 Russell's Anti-Friction, list Dec. 18, 1888.....60¢25¢
 Moore's Anti-Friction.....60¢

Sliding Shutter—
 R. & E. list Dec. 18, 1888.....60¢10¢25¢
 Sargent's list.....60¢10¢25¢
 Reading list.....60¢10¢10¢

Shells—
 First quality 4, 8, 10 and 12 gauge.....25¢10¢25¢
 First quality, 14, 16 and 20 gauge (10 list).....30¢10¢25¢
 Frise.....40¢25¢
 Star, Club, Rival and Climax brands.....\$3.45¢10¢25¢
 Setbold's Comb. Shot Shells.....15¢25¢
 Brass Shot Shells, 1st quality.....60¢25¢
 Brass Shot Shells, Club, Rival, Climax.....60¢25¢

Shells Loaded—
 Standard list, July 19, 1890.....40¢10¢10¢40¢10¢10¢25¢

Ship Tools—
 L. & J. White.....20¢25¢

Shoes, Horse, Mule, &c.—
Horse—
 Burden's, Perkins', Phoenix and Bryden's Boss, at factory.....\$4.00
 Bryden's Frog Pressure, at factory.....\$5.00

Mule—
 Add \$1¢ kg to above prices.

Oz. Wrought—
 Ton lots.....\$ 9¢
 1000 lb lots.....\$ 9¢4¢
 500 lb lots.....\$ 9¢10¢

Shot—
 Drop, up to B, 25-b bag.....\$1.30¢41.35¢
 Drop, up to B, 5-b bag......35¢
 Drop, B and larger, 25-b bag.....1.55¢1.60¢
 Drop, B and larger 5-b bag......40¢
 Buck and Chilled, 25-b bag.....1.55¢1.60¢
 Buck and Chilled, 5-b bag......40¢
 Dust Shot, 25-b bag.....1.95¢2.00¢
 Dust Shot, 5-b bag......45¢

Shovels and Spades—
 Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20¢
 Notz—Jobbers frequently give 5¢7¢4¢ extra on above.
 Griffin's Black Iron.....60¢10¢
 Griffin's C. S.....95¢60¢10¢
 Griffin's Solid C. S. R. Goods.....20¢
 St. Louis Shovel Co.....30¢20¢75¢
 Hussey, Hinns & Co.....15¢25¢
 Hubbard & Co.....20¢20¢75¢
 Lehigh Mfg. Co.....60¢10¢
 E. M. Myers Co.....30¢
 Payne Pettibone & Son.....30¢25¢
 Kemington's (Lowman's) Pat.....\$0¢10¢40¢
 Rowland's, Black Iron.....60¢10¢
 Rowland's Steel.....60¢25¢60¢10¢

Shovels and Tongs—
 Iron Head.....60¢10¢60¢10¢5¢
 Brass Head.....60¢10¢10¢

Shoes—
 Mann's Tin Rim.....60¢25¢
 Buffalo Metallic, S. S. & Co.....60¢25¢
 Shaker (Barber's) Pat. Flour Sifters.....\$ dos \$2.00¢; \$ gr \$21.60¢
 Electric.....\$ gr \$1.00¢
 A. & W. Sars.....\$ dos \$2.00¢
 Hunter's Adjustable Sifters.....\$ dos \$2.00¢
 Smith's Adjustable Milk Strainer.....\$ dos \$2.00¢
 Smith's Adjustable T. & C. Strainer.....\$ dos \$2.00¢
 F. Jos. \$1.25

Shoes, Wooden Rim—
 Mesh 18, Nested, \$ dos.....80¢
 Mesh 20, Nested, \$ dos.....95¢1.10¢
 Mesh 24, Nested, \$ dos.....\$1.15¢1.25¢

Skins, Thimble—
 Western list.....75¢5¢75¢10¢
 Columbus Wrt. Steel.....Special net prices
 Coldbrookdale Iron Co.....60¢
 Seneca Falls Pattern.....60¢
 Utica P. & T. Skins.....60¢
 Utica Turned and Fitted.....35¢

Slates—
 School, by case.....50¢10¢50¢10¢10¢
Snaps, Harness, &c.—
 Anchor (T. & S. Mfg. Co.).....65¢
 Fitch's (Bristol).....50¢10¢
 Hotchkiss.....10¢
 Andrews.....60¢
 Sargent's Patent Guarded.....70¢10¢10¢
 German, new list.....40¢10¢
 Covert, New Patent.....50¢10¢5¢25¢
 Covert, New R. E.....60¢10¢5¢25¢
 Covert Spring.....60¢10¢10¢
 E. Covert's Triumph.....35¢4¢

Snaths, Scythe.
 List.....50¢

Soldering Irons—See Irons, Soldering.
Spittoons, Cuspids, &c.—
 Standard Fiberglass—
 Cuspids, 8 1/4-inch, \$ dos., No. 5, \$5; No. 5X \$0.
 Spittoons, Daisy, 8-inch, No. 1, \$4; 10 and 11 inch, \$6.
Spoke Shaves—See Shaves, Spoke.
Spoke Trimmers—See Trimmers, Spoke.
Spoons and Ferns—
Tinned Iron—
 Basting, Cen. Stamp, Co.'s list.....70¢10¢
 Solid Table and Tea, Cen. Stamp, Co.'s list.....70¢10¢
 Buffalo S. & Co.....85¢25¢
Silver-Plated—(4 mos. or 5¢ cash 30 days.)
 Meriden Brit. Co., Rogers.....40¢15¢
 C. Rogers & Bros.....40¢15¢
 Rogers & Bro.....40¢15¢
 Reed & Barton.....40¢40¢25¢
 Wm. Rogers Mfg. Co.....40, 15¢25¢
 Simpson, Hall, Miller & Co.....40, 15¢25¢
 Holmes & Edwards Silver Co.....40, 15¢25¢
 L. Boardman & Son.....50¢12¢4¢

Miscellaneous.
 Holmes & Edwards Silver Co.:
 No. 97 Mexican Silver.....50¢10¢25¢
 No. 20 Silver Metal.....50¢10¢25¢
 No. 24 German Silver.....50¢10¢25¢
 No. 50 Nickel Silver.....50¢25¢
 No. 49 Nickel Silver.....50¢10¢25¢
 Wm. Rogers Mfg. Co.:
 Rogers' Silver Metal.....50, 10¢25¢
 130 Rott German Silver.....50¢25¢
 25¢ Rogers' Nickel Silver.....50¢25¢
 German Silver.....50¢50¢25¢
 German Silver, Hall & Elton.....50¢25¢ cash
 Nickel Silver.....50¢25¢10¢5¢ cash
 Britannia.....60¢60¢25¢
 Boardman's Nick'l Silver, list July 1, 1891.....60¢25¢
 Boardman's Britannia, Specimen, case lots.....60¢25¢ cash

Springs—
Door—
 Torrey's Rod, 30 in.....\$ dos \$1.20¢1.25¢
 Gray & W. F., \$20.00.....35¢
 Bee Rod W. F., \$20.00.....20¢25¢
 Warner's No. 1, \$ dos, \$2.50; No. 2, \$3.50.....50¢50¢5¢
 Gem (Coll), list April 19, 1888.....10¢10¢
 Star (Coll), list April 19, 1888.....20¢25¢
 Victor (Coll).....60¢10¢60¢10¢5¢
 Champion (Coll).....60¢10¢60¢10¢5¢
 Cowell's, No. 1, \$ dos, \$18.00; No. 2, \$15.00.....50¢50¢10¢
 Rubber, complete, \$ dos, \$4.50.....50¢50¢10¢
 Hercules.....50¢50¢10¢

Carriage, Wagon, &c.—
 Elliptic, Concord, Platform and Rail Scroll.....60¢10¢10¢
 Cliff's Bolster Springs.....30¢

Squares—
 Steel and Iron.....\$0¢10¢80¢10¢10¢
 Nickel-Plated.....60¢10¢
 Try Square and T Bevels.....60¢10¢60¢10¢
 10¢10¢
 Diston's Try Square and T Bevels.....50¢
 Winterbottom's Try and Miter.....30¢10¢
 Starrett's Micrometer Caliper Squares.....25¢
 Avery's Flush Bevel Squares.....40¢
 Avery's Bevel Protractor.....50¢

Squeezers.
Fodder—
 Blair's.....\$ dos \$2.00¢
 Blair's "Climax".....\$ dos \$1.25¢

Lemon—
 Porcelain Lined, No. 1.....\$ dos \$6.00¢
 25¢20¢
 Wood, No. 2.....\$ dos \$3.00¢35¢
 Wood, Common.....\$ dos \$1.70¢1.75¢
 Dunlap's Improved.....\$ dos \$3.75¢20¢
 Sammis.....No. 1, \$5.00; No. 2, \$9; 12, \$18 \$ dos.....25¢10¢
 Jennings' Star.....\$ dos \$2.50¢
 The Boss.....\$ dos \$2.50¢
 Dean's, Nos. 1, \$ dos \$6.50; 2, \$8.35; 3, \$1.90; Queen, \$2.50

Little Giant.....50¢50¢25¢
 King.....40¢25¢
 Hotchkiss Straight Flash.....\$ dos \$12.00¢
 Silver & Co., Glass.....\$ gro. \$9.00¢
 Manny Lemon Juice Extractor.....\$ dos \$2.50¢
 Standard.....\$ dos \$0.75¢\$1.00¢
 Improved.....\$ dos \$4.00¢

Standard Fiber Ware—See Ware, Standard Fiber.
Staples.
Blind—
 Barbed, 1/2 in. and larger.....\$ 7¢7¢4¢
 Barbed, 3/4 in.....\$ 4¢4¢4¢
 Fence Staples, Galvanized.....Same price
 Fence Staples, Plain.....\$ B'rd Wire
 See Trd. Rep.
 Steel Yards.....40¢10¢50¢

Stocks and Dies—
Blacksmith's
 Waterford Goods.....\$34¢40¢
 Butterfield's Goods.....\$34¢40¢
 Lightning Screw Plates.....\$34¢40¢
 Reece's New Screw Plates.....\$34¢40¢
 Reversible Ratchet.....\$0¢
 Gardner.....\$0¢

Stops, Bench.
 Morrill's.....\$ dos \$0, 50¢
 Hotchkiss.....\$ dos \$5, 10¢10¢10¢
 Weston's, No. 1, \$10; No. 2, \$5, 25¢10¢25¢
 McGill's.....\$ dos \$3, 10¢
 Cincinnati.....25¢10¢
 Terrell's Nos. 1 and 2, \$ dos, \$3; No. 3, \$3.60.....30¢

Stone—
 Hindostan No. 1, 8; Aze, 3 1/4; Slips No. 1, 4 1/4¢
 Sand Stone.....\$ 2¢4¢
 Washita Stone, Extra.....\$ 2¢25¢
 Washita Stone, No. 1.....\$ 2¢25¢
 Washita Stone, No. 2.....\$ 2¢25¢
 Washita Slips, No. 1, Extra.....\$ 4¢4¢4¢
 Washita Slips, No. 1, 6 to 9 in.....\$ 3¢3¢3¢
 Arkansas Stone, No. 1.....\$ 4¢4¢
 Arkansas Stone, No. 1, 6 to 9 in.....\$ 4¢4¢
 Turkey Oil Stone, 4 to 8 in.....\$ 4¢4¢
 Turkey Slips.....\$ \$1.00¢15¢
 Lake Superior, Chas.....\$ 13¢
 Lake Superior Slips, Chas.....\$ 20¢
 Seneca Stone, Red Paper Brand.....\$ 20¢
 Seneca Stone, High Rounds.....\$ 20¢25¢
 Seneca Stone, Small Whets.....\$ gro \$34.00¢

Stone Polish—See Polish, Stone.
Stretchers, Carpet.
 Cast Steel, Follared.....\$ dos \$2.50¢
 Cast Iron, Steel Polish.....\$ dos \$2.50¢
 Socket.....\$ dos \$1.75¢
 Jullard's.....25¢50¢10¢

Strops, Razor—
 Genuine Emerson.....60¢60¢25¢
 Imitation.....\$ dos \$2.00¢20¢10¢25¢
 Torrey's.....\$ dos \$2.50¢
 Badger's Belt and Com.....\$ dos \$2.50¢
 Lamont Combination.....\$ dos \$4.00¢
 Jordan's Pat. Padded, list Nov. 1, \$9.50¢
 Electric.....List nos

Stuffers or Fillers, Sausage.
 Miles' "Challenge," \$ dos \$30, 50¢50¢25¢
 Ferry.....\$ dos, No. 1, \$15.00; No. 2, \$25.00.....50¢50¢10¢
 Draw Up, No. 4, \$50.00.....30¢
 Enterprise Mfg. Co.....50¢10¢25¢
 Silver's.....40¢10¢

Sweepers, Carpet.
 Bisell No. 5.....\$ dos \$17.00¢
 Bisell No. 7, New Drop Pan, \$ dos \$15.00¢
 Bisell, Grand.....\$ dos \$35.00¢
 Grand Rapids.....\$ dos \$34.50¢
 Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00.....\$ dos \$15.00¢
 Magic.....\$ dos \$15.00¢
 Jewel.....\$ dos \$17.00¢
 Improved Factor Queen.....\$ dos \$27.00¢
 Nickerle.....\$ dos \$27.00¢
 Janned.....\$ dos \$24.00¢
 Excelsior.....\$ dos \$23.00¢
 Garland.....\$ dos \$18.00¢
 Parlor Queen.....\$ dos \$24.00¢
 Household's Delicat.....\$ dos \$15.00¢
 Queen.....\$ dos \$15.00¢
 Queen, with band.....\$ dos \$18.00¢
 King.....\$ dos \$20.00¢
 Weed, Improved.....\$ dos \$18.00¢
 Hub.....\$ dos \$15.00¢
 Cog-Wheel.....\$ dos \$15.00¢
 Easy.....\$ dos \$22.00¢
 Monarch.....\$ dos \$22.00¢
 Goshen.....\$ dos \$21.00¢
 Ladies' Friend.....\$ dos \$15.00¢
 Advance.....\$ dos \$18.00¢
 Supreme.....\$ dos \$22.00¢

Tacks, Brads, &c.—
 List October 19, 1890. Old established standard weights Short Weight goods are sold at lower prices.
Carpet Tacks.
 American, Blued.....75¢
 American, Tin'd and Cop'd, 7 1/2¢
 Steel, Bright and Blued.....72¢
 Steel, Tinned and Coppered 75¢
 Swedes Iron, Blued.....72¢
 Swedes Iron, Tinned.....72¢
 American Iron Tacks.....72¢
 Swedes Iron Tacks.....72¢
 S. S., Blued.....75¢
 S. S., Tinned.....77¢
 Lanc., Blued.....69¢
 Lanc., Tinned.....72¢
 Gimp and Lace Tacks.....75¢
 S. S., Blued.....77¢
 S. S., Tinned.....77¢
 Lanc., Blued.....69¢
 Lanc., Tinned.....72¢
Basket and Trimmers' Tacks—
 Lanc.....85¢
 S. S.....70¢
 Hungarian.....69¢
 Miners' Tacks, S. S.....75¢
 Miners' Tacks, Lanc.....70¢
 Common and Patent Brads.....60¢
 Leathered Tacks.....20¢
 Brush Tacks.....60¢
 Looking Glass Tacks.....60¢
 Picture-Frame Points.....60¢
 Finishing Nails.....60¢
 Trunk and Clout Nails.....60¢
 Black.....60¢
 Tinned or Coppered.....60¢
 Basket Nails.....62¢
 Chair Nails.....62¢
 Clear-Box Nails, see Nails, Wire.
 Tin Capped Nails.....60¢
Miscellaneous—
 D'ble-Point, 120 count 85¢10¢85¢10¢10¢
 Double Point, 100 count.....90¢
 Wire Carpet Nails.....50¢10¢
 Plymou Rock Steel Carpet Tacks.....50¢
 Wire Brads and Nails, see Nails, Wire.
 Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50¢10¢

Tapes, Measuring—
 American.....40¢10¢25¢
 Spring.....40¢
 Chesterman's, Regular list.....25¢30¢

Thermometers—
Tin Case.....50¢50¢10¢
Thimble Skins—See Skins.
Ties, Bale—
 standard Wire, list.....50¢10¢5¢
Tinners' Shears, &c.—See Shears, Tinnern's, &c.

Tinware—
Stamped, Janned and Pieced, list
Jan. 20 1887.....70¢10¢70¢25¢

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools—
Coopers—
Bradley's.....30¢
Barlow's.....30¢20¢25¢
I. & J. White.....30¢25¢
Albion Mfg. Co.....25¢
Beatty's.....30¢
Sandusky Tool Co.....30¢25¢
Shaves, Cincinnati Tool Co.....30¢

Lumber—
Ring Peavies, "Blue Line".....\$ dos \$90.00
Ring Peavies, Common.....\$ dos \$18.00
Steel Socket Peavies.....\$ dos \$31.00
Mail Iron Socket Peavies.....\$ dos \$10.00
Mail Hooks, "Blue Line".....\$ dos \$10.00
Mail Hooks, Common Finish.....\$ dos \$14.00
Mail Hooks, Mail Socket Clasp, "Blue Line" Finish.....\$ dos \$14.00
Mail Hooks, Mail Socket Clasp, Common Finish.....\$ dos \$14.50
Mail Hooks, Clip Clasp, "Blue Line" Finish.....\$ dos \$12.00
Mail Hooks, Clip Clasp, Common Finish.....\$ dos \$12.00
Hand Spikes.....\$ dos 6 ft., \$15.00; 8 ft., \$20.00

Pike Poles, Pike & Hook, \$ dos, 12 ft., \$11.50; 14 ft., \$13.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50.
Pike Poles, Pike only, \$ dos, 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00.
Pike Poles, not ironed, \$ dos, 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$15.00; 20 ft., \$17.00.
Setting Poles, \$ dos, 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00.
Swamp Hooks.....\$ dos \$18.00

Saw—
Atkins' Perfection.....\$ dos \$12.00
Atkins' Excelsior.....\$ dos \$6.00
Atkins' Giant.....\$ dos \$4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters—See Lifters, Transom.

Traps—
Game—

Newhouse.....40¢40¢55¢
Onida Pattern.....70¢10¢
Game, Blake's Patent.....40¢10¢55¢
House and Rat.....
Mouse Wood Choker, \$ dos holes, 9¢10¢
Mouse, Round Wire.....\$ dos \$1.50 10¢
Mouse, Cage Wire.....\$ dos \$2.50 10¢
Mouse, Catch-em-alive.....\$ dos \$2.50 10¢
Mouse, Bonanza.....\$ dos \$0.50 \$1.00
Rat, Decoy.....\$ gr \$10.00 10¢
Ideal.....\$ gr \$10.00 10¢
Cyclone.....\$ gr \$10.00 10¢
Hotchkiss Metallic Mouse, 5-hole trap, \$ dos, 90¢; in full cases, \$ dos.....75¢
Hotchkiss Imp. Rat Killer.....\$ gr \$18.50
Hotchkiss New Rat Killer.....\$ gr \$18.50
Schuyler's Rat Killer.....\$ gr \$18.50

Triers—
Butter and cheese.....25¢

Trimmers, Spoke.

Bonney's.....\$ dos \$10.00, 50¢
Beams'.....\$ dos \$10.00, 50¢
Ives, No. 1, \$15.00; No. 2, \$12.00, 20¢
Douglas.....\$ dos \$0.00, 20¢
Cincinnati.....25¢

Trowels—

Lothrop's Brick and Plastering.....20¢10¢55¢35¢
Reed's Brick and Plastering.....15¢
Dixon's Br & Plastering.....25¢
Peace's Plastering.....25¢
Clement & Maynard's.....25¢
Rose's Brick.....15¢50¢
Brade's Brick.....25¢
Worral's Brick and Plastering.....25¢
Carpenter
Cleves' Angle Trowel, \$ gr \$15, net @ 10¢

Trucks, Warehouse, &c—
R. & L. Block Co.'s list, '82.....40¢

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine— BC, B.
No. 9, 10 and 11 Balls.....25¢ 31¢
No. 12, 13 and 14 Balls.....25¢ 30¢
No. 15, 16 and 17 Balls.....25¢ 29¢
No. 18, 19 and 20 Balls.....25¢ 28¢
No. 21, 22 and 23 Balls.....25¢ 27¢
No. 24, 25 and 26 Balls.....25¢ 26¢
No. 27, 28 and 29 Balls.....25¢ 25¢
No. 30, 31 and 32 Balls.....25¢ 24¢
No. 33, 34 and 35 Balls.....25¢ 23¢
No. 36, 37 and 38 Balls.....25¢ 22¢
No. 39, 40 and 41 Balls.....25¢ 21¢
No. 42, 43 and 44 Balls.....25¢ 20¢
No. 45, 46 and 47 Balls.....25¢ 19¢
No. 48, 49 and 50 Balls.....25¢ 18¢
No. 51, 52 and 53 Balls.....25¢ 17¢
No. 54, 55 and 56 Balls.....25¢ 16¢
No. 57, 58 and 59 Balls.....25¢ 15¢
No. 60, 61 and 62 Balls.....25¢ 14¢
No. 63, 64 and 65 Balls.....25¢ 13¢
No. 66, 67 and 68 Balls.....25¢ 12¢
No. 69, 70 and 71 Balls.....25¢ 11¢
No. 72, 73 and 74 Balls.....25¢ 10¢
No. 75, 76 and 77 Balls.....25¢ 9¢
No. 78, 79 and 80 Balls.....25¢ 8¢
No. 81, 82 and 83 Balls.....25¢ 7¢
No. 84, 85 and 86 Balls.....25¢ 6¢
No. 87, 88 and 89 Balls.....25¢ 5¢
No. 90, 91 and 92 Balls.....25¢ 4¢
No. 93, 94 and 95 Balls.....25¢ 3¢
No. 96, 97 and 98 Balls.....25¢ 2¢
No. 99, 100 and 101 Balls.....25¢ 1¢
No. 102, 103 and 104 Balls.....25¢ 1¢
No. 105, 106 and 107 Balls.....25¢ 1¢
No. 108, 109 and 110 Balls.....25¢ 1¢
No. 111, 112 and 113 Balls.....25¢ 1¢
No. 114, 115 and 116 Balls.....25¢ 1¢
No. 117, 118 and 119 Balls.....25¢ 1¢
No. 120, 121 and 122 Balls.....25¢ 1¢
No. 123, 124 and 125 Balls.....25¢ 1¢
No. 126, 127 and 128 Balls.....25¢ 1¢
No. 129, 130 and 131 Balls.....25¢ 1¢
No. 132, 133 and 134 Balls.....25¢ 1¢
No. 135, 136 and 137 Balls.....25¢ 1¢
No. 138, 139 and 140 Balls.....25¢ 1¢
No. 141, 142 and 143 Balls.....25¢ 1¢
No. 144, 145 and 146 Balls.....25¢ 1¢
No. 147, 148 and 149 Balls.....25¢ 1¢
No. 150, 151 and 152 Balls.....25¢ 1¢
No. 153, 154 and 155 Balls.....25¢ 1¢
No. 156, 157 and 158 Balls.....25¢ 1¢
No. 159, 160 and 161 Balls.....25¢ 1¢
No. 162, 163 and 164 Balls.....25¢ 1¢
No. 165, 166 and 167 Balls.....25¢ 1¢
No. 168, 169 and 170 Balls.....25¢ 1¢
No. 171, 172 and 173 Balls.....25¢ 1¢
No. 174, 175 and 176 Balls.....25¢ 1¢
No. 177, 178 and 179 Balls.....25¢ 1¢
No. 180, 181 and 182 Balls.....25¢ 1¢
No. 183, 184 and 185 Balls.....25¢ 1¢
No. 186, 187 and 188 Balls.....25¢ 1¢
No. 189, 190 and 191 Balls.....25¢ 1¢
No. 192, 193 and 194 Balls.....25¢ 1¢
No. 195, 196 and 197 Balls.....25¢ 1¢
No. 198, 199 and 200 Balls.....25¢ 1¢
No. 201, 202 and 203 Balls.....25¢ 1¢
No. 204, 205 and 206 Balls.....25¢ 1¢
No. 207, 208 and 209 Balls.....25¢ 1¢
No. 210, 211 and 212 Balls.....25¢ 1¢
No. 213, 214 and 215 Balls.....25¢ 1¢
No. 216, 217 and 218 Balls.....25¢ 1¢
No. 219, 220 and 221 Balls.....25¢ 1¢
No. 222, 223 and 224 Balls.....25¢ 1¢
No. 225, 226 and 227 Balls.....25¢ 1¢
No. 228, 229 and 230 Balls.....25¢ 1¢
No. 231, 232 and 233 Balls.....25¢ 1¢
No. 234, 235 and 236 Balls.....25¢ 1¢
No. 237, 238 and 239 Balls.....25¢ 1¢
No. 240, 241 and 242 Balls.....25¢ 1¢
No. 243, 244 and 245 Balls.....25¢ 1¢
No. 246, 247 and 248 Balls.....25¢ 1¢
No. 249, 250 and 251 Balls.....25¢ 1¢
No. 252, 253 and 254 Balls.....25¢ 1¢
No. 255, 256 and 257 Balls.....25¢ 1¢
No. 258, 259 and 260 Balls.....25¢ 1¢
No. 261, 262 and 263 Balls.....25¢ 1¢
No. 264, 265 and 266 Balls.....25¢ 1¢
No. 267, 268 and 269 Balls.....25¢ 1¢
No. 270, 271 and 272 Balls.....25¢ 1¢
No. 273, 274 and 275 Balls.....25¢ 1¢
No. 276, 277 and 278 Balls.....25¢ 1¢
No. 279, 280 and 281 Balls.....25¢ 1¢
No. 282, 283 and 284 Balls.....25¢ 1¢
No. 285, 286 and 287 Balls.....25¢ 1¢
No. 288, 289 and 290 Balls.....25¢ 1¢
No. 291, 292 and 293 Balls.....25¢ 1¢
No. 294, 295 and 296 Balls.....25¢ 1¢
No. 297, 298 and 299 Balls.....25¢ 1¢
No. 300, 301 and 302 Balls.....25¢ 1¢
No. 303, 304 and 305 Balls.....25¢ 1¢
No. 306, 307 and 308 Balls.....25¢ 1¢
No. 309, 310 and 311 Balls.....25¢ 1¢
No. 312, 313 and 314 Balls.....25¢ 1¢
No. 315, 316 and 317 Balls.....25¢ 1¢
No. 318, 319 and 320 Balls.....25¢ 1¢
No. 321, 322 and 323 Balls.....25¢ 1¢
No. 324, 325 and 326 Balls.....25¢ 1¢
No. 327, 328 and 329 Balls.....25¢ 1¢
No. 330, 331 and 332 Balls.....25¢ 1¢
No. 333, 334 and 335 Balls.....25¢ 1¢
No. 336, 337 and 338 Balls.....25¢ 1¢
No. 339, 340 and 341 Balls.....25¢ 1¢
No. 342, 343 and 344 Balls.....25¢ 1¢
No. 345, 346 and 347 Balls.....25¢ 1¢
No. 348, 349 and 350 Balls.....25¢ 1¢
No. 351, 352 and 353 Balls.....25¢ 1¢
No. 354, 355 and 356 Balls.....25¢ 1¢
No. 357, 358 and 359 Balls.....25¢ 1¢
No. 360, 361 and 362 Balls.....25¢ 1¢
No. 363, 364 and 365 Balls.....25¢ 1¢
No. 366, 367 and 368 Balls.....25¢ 1¢
No. 369, 370 and 371 Balls.....25¢ 1¢
No. 372, 373 and 374 Balls.....25¢ 1¢
No. 375, 376 and 377 Balls.....25¢ 1¢
No. 378, 379 and 380 Balls.....25¢ 1¢
No. 381, 382 and 383 Balls.....25¢ 1¢
No. 384, 385 and 386 Balls.....25¢ 1¢
No. 387, 388 and 389 Balls.....25¢ 1¢
No. 390, 391 and 392 Balls.....25¢ 1¢
No. 393, 394 and 395 Balls.....25¢ 1¢
No. 396, 397 and 398 Balls.....25¢ 1¢
No. 399, 400 and 401 Balls.....25¢ 1¢
No. 402, 403 and 404 Balls.....25¢ 1¢
No. 405, 406 and 407 Balls.....25¢ 1¢
No. 408, 409 and 410 Balls.....25¢ 1¢
No. 411, 412 and 413 Balls.....25¢ 1¢
No. 414, 415 and 416 Balls.....25¢ 1¢
No. 417, 418 and 419 Balls.....25¢ 1¢
No. 420, 421 and 422 Balls.....25¢ 1¢
No. 423, 424 and 425 Balls.....25¢ 1¢
No. 426, 427 and 428 Balls.....25¢ 1¢
No. 429, 430 and 431 Balls.....25¢ 1¢
No. 432, 433 and 434 Balls.....25¢ 1¢
No. 435, 436 and 437 Balls.....25¢ 1¢
No. 438, 439 and 440 Balls.....25¢ 1¢
No. 441, 442 and 443 Balls.....25¢ 1¢
No. 444, 445 and 446 Balls.....25¢ 1¢
No. 447, 448 and 449 Balls.....25¢ 1¢
No. 450, 451 and 452 Balls.....25¢ 1¢
No. 453, 454 and 455 Balls.....25¢ 1¢
No. 456, 457 and 458 Balls.....25¢ 1¢
No. 459, 460 and 461 Balls.....25¢ 1¢
No. 462, 463 and 464 Balls.....25¢ 1¢
No. 465, 466 and 467 Balls.....25¢ 1¢
No. 468, 469 and 470 Balls.....25¢ 1¢
No. 471, 472 and 473 Balls.....25¢ 1¢
No. 474, 475 and 476 Balls.....25¢ 1¢
No. 477, 478 and 479 Balls.....25¢ 1¢
No. 480, 481 and 482 Balls.....25¢ 1¢
No. 483, 484 and 485 Balls.....25¢ 1¢
No. 486, 487 and 488 Balls.....25¢ 1¢
No. 489, 490 and 491 Balls.....25¢ 1¢
No. 492, 493 and 494 Balls.....25¢ 1¢
No. 495, 496 and 497 Balls.....25¢ 1¢
No. 498, 499 and 500 Balls.....25¢ 1¢
No. 501, 502 and 503 Balls.....25¢ 1¢
No. 504, 505 and 506 Balls.....25¢ 1¢
No. 507, 508 and 509 Balls.....25¢ 1¢
No. 510, 511 and 512 Balls.....25¢ 1¢
No. 513, 514 and 515 Balls.....25¢ 1¢
No. 516, 517 and 518 Balls.....25¢ 1¢
No. 519, 520 and 521 Balls.....25¢ 1¢
No. 522, 523 and 524 Balls.....25¢ 1¢
No. 525, 526 and 527 Balls.....25¢ 1¢
No. 528, 529 and 530 Balls.....25¢ 1¢
No. 531, 532 and 533 Balls.....25¢ 1¢
No. 534, 535 and 536 Balls.....25¢ 1¢
No. 537, 538 and 539 Balls.....25¢ 1¢
No. 540, 541 and 542 Balls.....25¢ 1¢
No. 543, 544 and 545 Balls.....25¢ 1¢
No. 546, 547 and 548 Balls.....25¢ 1¢
No. 549, 550 and 551 Balls.....25¢ 1¢
No. 552, 553 and 554 Balls.....25¢ 1¢
No. 555, 556 and 557 Balls.....25¢ 1¢
No. 558, 559 and 560 Balls.....25¢ 1¢
No. 561, 562 and 563 Balls.....25¢ 1¢
No. 564, 565 and 566 Balls.....25¢ 1¢
No. 567, 568 and 569 Balls.....25¢ 1¢
No. 570, 571 and 572 Balls.....25¢ 1¢
No. 573, 574 and 575 Balls.....25¢ 1¢
No. 576, 577 and 578 Balls.....25¢ 1¢
No. 579, 580 and 581 Balls.....25¢ 1¢
No. 582, 583 and 584 Balls.....25¢ 1¢
No. 585, 586 and 587 Balls.....25¢ 1¢
No. 588, 589 and 590 Balls.....25¢ 1¢
No. 591, 592 and 593 Balls.....25¢ 1¢
No. 594, 595 and 596 Balls.....25¢ 1¢
No. 597, 598 and 599 Balls.....25¢ 1¢
No. 600, 601 and 602 Balls.....25¢ 1¢
No. 603, 604 and 605 Balls.....25¢ 1¢
No. 606, 607 and 608 Balls.....25¢ 1¢
No. 609, 610 and 611 Balls.....25¢ 1¢
No. 612, 613 and 614 Balls.....25¢ 1¢
No. 615, 616 and 617 Balls.....25¢ 1¢
No. 618, 619 and 620 Balls.....25¢ 1¢
No. 621, 622 and 623 Balls.....25¢ 1¢
No. 624, 625 and 626 Balls.....25¢ 1¢
No. 627, 628 and 629 Balls.....25¢ 1¢
No. 630, 631 and 632 Balls.....25¢ 1¢
No. 633, 634 and 635 Balls.....25¢ 1¢
No. 636, 637 and 638 Balls.....25¢ 1¢
No. 639, 640 and 641 Balls.....25¢ 1¢
No. 642, 643 and 644 Balls.....25¢ 1¢
No. 645, 646 and 647 Balls.....25¢ 1¢
No. 648, 649 and 650 Balls.....25¢ 1¢
No. 651, 652 and 653 Balls.....25¢ 1¢
No. 654, 655 and 656 Balls.....25¢ 1¢
No. 657, 658 and 659 Balls.....25¢ 1¢
No. 660, 661 and 662 Balls.....25¢ 1¢
No. 663, 664 and 665 Balls.....25¢ 1¢
No. 666, 667 and 668 Balls.....25¢ 1¢
No. 669, 670 and 671 Balls.....25¢ 1¢
No. 672, 673 and 674 Balls.....25¢ 1¢
No. 675, 676 and 677 Balls.....25¢ 1¢
No. 678, 679 and 680 Balls.....25¢ 1¢
No. 681, 682 and 683 Balls.....25¢ 1¢
No. 684, 685 and 686 Balls.....25¢ 1¢
No. 687, 688 and 689 Balls.....25¢ 1¢
No. 690, 691 and 692 Balls.....25¢ 1¢
No. 693, 694 and 695 Balls.....25¢ 1¢
No. 696, 697 and 698 Balls.....25¢ 1¢
No. 699, 700 and 701 Balls.....25¢ 1¢
No. 702, 703 and 704 Balls.....25¢ 1¢
No. 705, 706 and 707 Balls.....25¢ 1¢
No. 708, 709 and 710 Balls.....25¢ 1¢
No. 711, 712 and 713 Balls.....25¢ 1¢
No. 714, 715 and 716 Balls.....25¢ 1¢
No. 717, 718 and 719 Balls.....25¢ 1¢
No. 720, 721 and 722 Balls.....25¢ 1¢
No. 723, 724 and 725 Balls.....25¢ 1¢
No. 726, 727 and 728 Balls.....25¢ 1¢
No. 729, 730 and 731 Balls.....25¢ 1¢
No. 732, 733 and 734 Balls.....25¢ 1¢
No. 735, 736 and 737 Balls.....25¢ 1¢
No. 738, 739 and 740 Balls.....25¢ 1¢
No. 741, 742 and 743 Balls.....25¢ 1¢
No. 744, 745 and 746 Balls.....25¢ 1¢
No. 747, 748 and 749 Balls.....25¢ 1¢
No. 750, 751 and 752 Balls.....25¢ 1¢
No. 753, 754 and 755 Balls.....25¢ 1¢
No. 756, 757 and 758 Balls.....25¢ 1¢
No. 759, 760 and 761 Balls.....25¢ 1¢
No. 762, 763 and 764 Balls.....25¢ 1¢
No. 765, 766 and 767 Balls.....25¢ 1¢
No. 768, 769 and 770 Balls.....25¢ 1¢
No. 771, 772 and 773 Balls.....25¢ 1¢
No. 774, 775 and 776 Balls.....25¢ 1¢
No. 777, 778 and 779 Balls.....25¢ 1¢
No. 780, 781 and 782 Balls.....25¢ 1¢
No. 783, 784 and 785 Balls.....25¢ 1¢
No. 786, 787 and 788 Balls.....25¢ 1¢
No. 789, 790 and 791 Balls.....25¢ 1¢
No. 792, 793 and 794 Balls.....25¢ 1¢
No. 795, 796 and 797 Balls.....25¢ 1¢
No. 798, 799 and 800 Balls.....25¢ 1¢
No. 801, 802 and 803 Balls.....25¢ 1¢
No. 804, 805 and 806 Balls.....25¢ 1¢
No. 807, 808 and 809 Balls.....25¢ 1¢
No. 810, 811 and 812 Balls.....25¢ 1¢
No. 813, 814 and 815 Balls.....25¢ 1¢
No. 816, 817 and 818 Balls.....25¢ 1¢
No. 819, 820 and 821 Balls.....25¢ 1¢
No. 822, 823 and 824 Balls.....25¢ 1¢
No. 825, 826 and 827 Balls.....25¢ 1¢
No. 828, 829 and 830 Balls.....25¢ 1¢
No. 831, 832 and 833 Balls.....25¢ 1¢
No. 834, 835 and 836 Balls.....25¢ 1¢
No. 837, 838 and 839 Balls.....25¢ 1¢
No. 840, 841 and 842 Balls.....25¢ 1¢
No. 843, 844 and 845 Balls.....25¢ 1¢
No. 846, 847 and 848 Balls.....25¢ 1¢
No. 849, 850 and 851 Balls.....25¢ 1¢
No. 852, 853 and 854 Balls.....25¢ 1¢
No. 855, 856 and 857 Balls.....25¢ 1¢
No. 858, 859 and 860 Balls.....25¢ 1¢
No. 861, 862 and 863 Balls.....25¢ 1¢
No. 864, 865 and 866 Balls.....25¢ 1¢
No. 867, 868 and 869 Balls.....25¢ 1¢
No. 870, 871 and 872 Balls.....25¢ 1¢
No. 873, 874 and 875 Balls.....25¢ 1¢
No. 876, 877 and 878 Balls.....25¢ 1¢
No. 879, 880 and 881 Balls.....25¢ 1¢
No. 882, 883 and 884 Balls.....25¢ 1¢
No. 885, 886 and 887 Balls.....25¢ 1¢
No. 888, 889 and 890 Balls.....25¢ 1¢
No. 891, 892 and 893 Balls.....25¢ 1¢
No. 894, 895 and 896 Balls.....25¢ 1¢
No. 897, 898 and 899 Balls.....25¢ 1¢
No. 900, 901 and 902 Balls.....25¢ 1¢
No. 903, 904 and 905 Balls.....25¢ 1¢
No. 906, 907 and 908 Balls.....25¢ 1¢
No. 909, 910 and 911 Balls.....25¢ 1¢
No. 912, 913 and 914 Balls.....25¢ 1¢
No. 915, 916 and 917 Balls.....25¢ 1¢
No. 918, 919 and 920 Balls.....25¢ 1¢
No. 921, 922 and 923 Balls.....25¢ 1¢
No. 924, 925 and 926 Balls.....25¢ 1¢
No. 927, 928 and 929 Balls.....25¢ 1¢
No. 930, 931 and 932 Balls.....25¢ 1¢
No. 933, 934 and 935 Balls.....25¢ 1¢
No. 936, 937 and 938 Balls.....25¢ 1¢
No. 939, 940 and 941 Balls.....25¢ 1¢
No. 942, 943 and 944 Balls.....25¢ 1¢
No. 945, 946 and 947 Balls.....25¢ 1¢
No. 948, 949 and 950 Balls.....25¢ 1¢
No. 951, 952 and 953 Balls.....25¢ 1¢
No. 954, 955 and 956 Balls.....25¢ 1¢
No. 957, 958 and 959 Balls.....25¢ 1¢
No. 960, 961 and 962 Balls.....25¢ 1¢
No. 963, 964 and 965 Balls.....25¢ 1¢
No. 966, 967 and 968 Balls.....25¢ 1¢
No. 969, 970 and 971 Balls.....25¢ 1¢
No. 972, 973 and 974 Balls.....25¢ 1¢
No. 975, 976 and 977 Balls.....25¢ 1¢
No. 978, 979 and 980 Balls.....25¢ 1¢
No. 981, 982 and 983 Balls.....25¢ 1¢
No. 984, 985 and 986 Balls.....25¢ 1¢
No. 987, 988 and 989 Balls.....25¢ 1¢
No. 990, 991 and 992 Balls.....25¢ 1¢
No. 993, 994 and 995 Balls.....25¢ 1¢
No. 996, 997 and 998 Balls.....25¢ 1¢
No. 999, 1000 and 1001 Balls.....25¢ 1¢
No. 1002, 1003 and 1004 Balls.....25¢ 1¢
No. 1005, 1006 and 1007 Balls.....25¢ 1¢
No. 1008, 1009 and 1010 Balls.....25¢ 1¢
No. 1011, 1012 and 1013 Balls.....25¢ 1¢
No. 1014, 1015 and 1016 Balls.....25¢ 1¢
No. 1017, 1018 and 1019 Balls.....25¢ 1¢
No. 1020, 1021 and 1022 Balls.....25¢ 1¢
No. 1023, 1024 and 1025 Balls.....25¢ 1¢
No. 1026, 1027 and 1028 Balls.....25¢ 1¢
No. 1029, 1030 and 1031 Balls.....25¢ 1¢
No. 1032, 1033 and 1034 Balls.....25¢ 1¢
No. 1035, 1036 and 1037 Balls.....25¢ 1¢
No. 1038, 1039 and 1040 Balls.....25¢ 1¢
No. 1041, 1042 and 1043 Balls.....25¢ 1¢
No. 1044, 1045 and 1046 Balls.....25¢ 1¢
No. 1047, 1048 and 1049 Balls.....25¢ 1¢
No. 1050, 1051 and 1052 Balls.....25¢ 1¢
No. 1053, 1054 and 1055 Balls.....25¢ 1¢
No. 1056, 1057 and 1058 Balls.....25¢ 1¢
No. 1059, 1060 and 1061 Balls.....25¢ 1¢
No. 1062, 1063 and 1064 Balls.....25¢ 1¢
No. 1065, 1066 and 1067 Balls.....25¢ 1¢
No. 1068, 1069 and 1070 Balls.....25¢ 1¢
No. 1071, 1072 and 1073 Balls.....25¢ 1¢
No. 1074, 1075 and 1076 Balls.....25¢ 1¢
No. 1077, 1078 and 1079 Balls.....25¢ 1¢
No. 1080, 1081 and 1082 Balls.....25¢ 1¢
No. 1083, 1084 and 1085 Balls.....25¢ 1¢
No. 1086, 1087 and 1088 Balls.....25¢ 1¢
No. 1089, 1090 and 1091 Balls.....25¢ 1¢
No. 1092, 1093 and 1094 Balls.....25¢ 1¢
No. 1095, 1096 and 1097 Balls.....25¢ 1¢
No. 1098, 1099 and 1100 Balls.....25¢ 1¢
No. 1101, 1102 and 1103 Balls.....25¢ 1¢
No. 1104, 1105 and 1106 Balls.....25¢ 1¢
No. 1107, 1108 and 1109 Balls.....25¢ 1¢
No. 1110, 1111 and 1112 Balls.....25¢ 1¢
No. 1113, 1114 and 1115 Balls.....25¢ 1¢
No. 1116, 1117 and 1118 Balls.....25¢ 1¢
No. 1119, 1120 and 1121 Balls.....25¢ 1¢
No. 1122, 1123 and 1124 Balls.....25¢ 1¢
No. 1125, 1126 and 1127 Balls.....25¢ 1¢
No. 1128,

